STARTUP DILEMMAS - STRATEGIC PROBLEMS OF EARLY-STAGE PLATFORMS ON THE INTERNET

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SUMMARY

Startup dilemmas – Strategic problems of early-stage platforms on the Internet

Platform startups on the Internet are an under-researched type of business, although some have demonstrated exceptionally high growth and global penetration (e.g., Google, Facebook, and Tinder). As growth-oriented new ventures are generally important for economic development, and given that their failure rate is generally high, the study focuses on a meaningful topic.

Platforms are defined as "places of interaction", in which technology is employed to connect different user groups. Based on interaction, four platform types are defined: 1) content platforms, 2) social platforms, 3) exchange platforms, and 4) infrastructure. Their complements and usage motives vary; however, they inherit similar problems from the platform model.

The theoretical basis of this work derives from the literature on two-sided markets. In addition, works analyzing platforms in the field of marketing, information system sciences, and network economics are included. Key constructs, many of which originate from earlier research on networks and standards, include network effects, critical mass, winner-takes-all, tipping, two-sidedness, and the chicken-and-egg problem. To complete the theoretical perspective, concepts on online specificities are also included; namely, user-generated content, indirect monetization, and the freemium business model.

The methodological approach is grounded theory (GT) which is an inductive method emphasizing a close connection of the researcher to the analyzed material. GT includes coding, that is, raising the abstraction level by conceptualizing central themes (i.e., categories); constant comparison of novel findings to those previously found; and theoretical sampling, that is, the systematic attempt to challenge and extend ideas by collecting more material. A heavy emphasis in this method is placed on the researcher's ability to conceptualize and theorize (i.e., theoretical sensitivity).

Most often, the method is applied to qualitative data, as also is the case in this study. In total, 29 post-mortem stories written by founders of failed startup ventures are analyzed. These data, publicly available on the Internet, comprise the study's principal material. Additional data include secondary startup interviews, interviews of six founders conducted by the author, and discussions at numerous startup events in Finland, Sweden, and the USA over the four year research process. Participation comprised discussions with founders in the attempt to verify ideas on the emerging theoretical model, and gain valuable industry insight.

In the analysis, four dilemmas of platform startups, emerged: 1) cold start dilemma, 2) lonely user dilemma, 3) monetization dilemma, and 4) remora's curse. The first two are variants of the chicken-and-egg problem; in a cold start, there is a lack of content due to the lack of content, so users are unwilling to join the platform. In the lonely user dilemma, there might be registered users, but none are present at a given time or place; thus, there is no reason to use the platform. In the monetization dilemma, users are given free access and usage, but at the expense of revenue. When fees are introduced, the users flee. In the remora's curse, a startup is able to solve the cold start dilemma by integrating into a larger platform, but becomes vulnerable to its strategic behavior.

Essentially, the problems are interlinked. By solving the chicken-and-egg problem through subsidization, a commonly applied strategy, a startup moves toward the monetization dilemma and eventually fails for this reason. It might also solve the problem by platform integration, or becoming a complementor for a larger platform. It has been previously argued in the platform literature that, if successful, the remora can perform envelopment, whereby it permanently captures the host’s users. However, in this study it is argued that the power dynamics do not favor the startup, which remains vulnerable to the dominant platform’s opportunism. In this study, “selective integration” (i.e., content and value envelopment) is suggested as an alternative. In addition, the merits and downsides of multihoming and the freemium model are discussed.

The study makes several contributions. First, the scope of the chicken-and-egg problem, and also its solutions, is expanded to fit the realities of online startups. This enables more useful approaches than most other studies focusing on larger firms, exchange platforms, and pricing as a solution. Second, it is shown that the strategic problems of early-stage platforms are connected, which should be considered in studies. For practitioners, this implies the recognition of the “dilemma roadmap” as a tool for strategic planning. Third, a total of 19 different solutions are analyzed, and the requirements for a “perfect solution” are characterized. Fourth, novel constructs are introduced for use and further development by scholars. Finally, several avenues for further research are put forward; for example, integration of founders’ biases into a theory, expansion of platform theory, and the pursuit of more solutions.

Although “one size fits all” solutions are unlikely, theoretical analysis of the solutions, even if complicated by reality, is a useful process to understand the fundamental forces by which they are affected. Eventually, models can be expanded to cover more aspects, thus enabling better solutions to emerge from the cooperation of theory and practice.

Keywords: platforms, two-sided markets, startups, chicken-and-egg problem

TIIVISTELMÄ

Startup-dilemmat – Alkuvaiheen alustojen strategiset ongelmat Internetissä

Tutkin alkuvaiheen Internet-alustojen strategisia ongelmia. Niitä on tutkittu suhteellisen vähän, vaikka osa alustoista on saavuttanut poikkeuksellisen nopean kasvun (esim. Google, Facebook ja Tinder). Koska kasvuhakuiset yrityshankkeet ovat yleisesti ottaen tärkeitä taloudellisen kehityksen ja innovaatioiden kannalta ja koska niiden kuolleisuus on yleensä korkea, tutkimuksen aihe on mielekäs. Aihe ei kuitenkaan kosketa pelkästään yhteiskuntaa, vaan myös yksittäisiä yrityksiä ja yrittäjiä, jotka kamppailevat näiden strategisten ongelmien ja globaalin kilpailun parissa.

Alusta määritellään vuorovaikutusympäristöksi, jossa teknologia yhdistää eri käyttäjäryhmiä. Käyttömotiivin perusteella työ jakaa Internet-pohjaiset alustat neljään tyyppiin: 1) sisältöalustat, 2) sosiaaliset alustat, 3) vaihdantaalustat ja 4) infrastruktuuri. Vaikka niiden välillä on eroja, em. alustat jakavat samat alustaliiketoimintamallin ongelmat.

Työn teoreettinen pohja on peräisin kaksipuolisten markkinoiden kirjallisuudesta. Lisäksi hyödynnetään markkinoinnin, tietojärjestelmätieteiden ja verkostotaloustieteen kirjallisuutta. Keskeisiä käsitteitä ovat verkostovaikutukset, kriittinen massa, "voittaja vie kaiken" -ilmiö, kaksi-suuntaisuus, ja muna-kanaongelma. Em. kirjallisuushaarat ymmärretään tässä työssä alustakirjallisuutena. Internet-liiketoiminnan erityispiirteet, kuten käyttäjien tuottama sisältö ja epäsuora ansaintalogiikka, ovat myös mukana.

Metodina on grounded theory (GT), jonka soveltamiseen kuuluu koodaus, eli käsitteellisen tason nostaminen aineiston keskeisiä teemoja nimeämällä ja arvioimalla, jatkuva vertailu uusien ja edellisten löydösten välillä ja teoreettinen otanta, eli luotujen teoreettisten konstruktioiden (teorian) systemaattinen täydentäminen ja haastaminen lisämateriaalin avulla. Metodi painottaa vahvasti tutkijan kykyä käsitteellistää ja teoretisoida laadullista ja määrällistä aineistoa, ts. teoreettista herkkyyttä. Useimmiten GT-menetelmää sovelletaan laadulliseen aineistoon, ja niin tässäkin tutkimuksessa. Pääasiallisen aineiston muodostaa 29 epäonnistumiskertomusta; lisäksi aineistoon kuuluu haastatteluja ja keskusteluja useissa startup-tapahtumissa Suomessa, Ruotsissa ja Yhdysvalloissa nelivuotisen tutkimusprosessin aikana.

Analyysin yhteydessä päätettiin keskittyä alustastartupeille ominaisiin ongelmiin, eli startup-dilemmoihin, erityisesti: 1) kylmän alun ongelma, 2) yksinäisen käyttäjän dilemma, 3) monetisointidilemma ja 4) remoran kirous. Ensimmäiset kaksi ovat muunnelmia muna-kanaongelmasta, jota on laajalti käsitelty kirjallisuudessa. Kylmän alun ongelmassa sisällönpuute estää sisältöä

luovien käyttäjien alustaan liittymisen, ja näin yhdelläkään käyttäjällä ei ole motiivia rekisteröityä. Yksinäinen käyttäjä saattaa sen sijaan olla jo rekisteröitynyt, mutta koska vastapuoli ei ole läsnä tietyssä ajassa tai paikassa, alustan käytölle ei ole mahdollisuutta.

Monetisointidilemman mukaan käyttäjät houkutellaan alustaan tarjoamalla ilmainen pääsy ja käyttö, mutta taloudellisen kannattavuuden kustannuksella. Heti kun maksut otetaan käyttöön, käyttäjät pakenevat alustalta. Remoran kirouksessa muna-kanaongelma on ratkaistu integroimalla suurempaan alustaan, mutta vastineeksi joudutaan alttiiksi tämän alustajan omistajan strategiselle käyttäytymiselle. Näiden dilemmojen analysointi, niiden sovittaminen aiempaan kirjallisuuteen sekä yritys löytää mahdollisia ratkaisuja ovat tämän työn keskeistä antia.

Tutkimus tekee useita kontribuutioita. Ensinnäkin muna-kanaongelma laajennetaan Internet-liiketoiminnan yhteyteen. Useimmat muut tutkimukset keskittyvät suuriin yrityksiin, vaihdanta-alustoihin, ja hinnoitteluun muna-kanaongelman ratkaisuna. Toiseksi työ osoittaa, että alkuvaiheen alustojen strategiset ongelmat ovat sidoksissa toisiinsa. Yrityksille tämä merkitsee "dilemmatiekartan" hyödyntämistä strategisen toiminnan työkaluna, kun taas tutkijoille se korostaa tarvetta lähestyä alustaongelmia kokonaisvaltaisesti. Myös mahdollisia ratkaisuja pohditaan laajalti: yhteensä tarkastellaan 19 eri strategian soveltuvuutta dilemmojen ratkaisuun. Tutkimus esittää "täydellisen ratkaisun" ominaispiirteet ja useita lupaavia mahdollisuuksia lisätutkimuksiin, mm. yhdistämällä perustajien "harhat" osaksi teoriaa, laajentamalla alustateoriaa ja etsimällä uusia ratkaisuja metodologisen pluralismin avulla.

Tutkimuksen mukaan muna-kanaongelmalla on kytkeytynyt luonne Internet-alustojen yhteydessä; toisin sanoen yhden ongelman ratkaisu johtaa pian toiseen. Tilannetta pahentaa ns. "kiitorata-efekti", jonka mukaan aloittelevalla yrityksellä on rajallinen aika saavuttaa onnistumisia ennen sen lopettamista. Olennainen lähtökohta on, että alusta ei kykene aina yhdistämään sopivia käyttäjiä tai sisältöjä toistensa kanssa ja siten ratkaisemaan muna-kanaongelmaa. Lisäksi ongelmaa ei voida ratkaista kerralla ja sitten jatkaa eteenpäin, vaan yksinäisen käyttäjän dilemma seuraa alustaa niin kauan kuin se on olemassa. Ellei yritys tunnista ongelmia ajoissa, havaitse niiden välisiä yhteyksiä ja sovella oikeita ratkaisuja, epäonnistumisen todennäköisyys kasvaa. Siksi dilemmojen luonteen ymmärtäminen on ensiarvoisen tärkeää alustaliiketoiminnassa menestymisen kannalta.

Asiasanat: alustat, kaksisuuntaiset markkinat, startupit, muna-kanaongelma

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Turku, 14th September 2014
Joni Salminen

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GLOSSARY

Chicken-and-egg problem: the tendency of users not to join a platform if others are not joining.
Complement (complementary good): an offering such as a service, program, game, or other type of application provided by a first- or third-party in a platform.
Complementor: a provider of a complement to a given platform.
Content platform: a platform for distributing, consuming, and sharing content.
Critical mass: the number and quality of members/complements required to convince others to join a platform.
Cross-side network externality: see *indirect network effect.*
Demand side: end users of a platform.
Direct network effect: a network effect applying to users of the same kind that can be grouped as one based on their motives or interests (e.g., fans of the same topic).
Envelopment: a strategy for one platform to capture users of another platform.
Exchange platform: a platform connecting buyers and sellers.
Exclusivity: a rule requiring complementors to single-home (see *single-homing*).
Feedback loop: a positive or negative reinforcing effect according to which members of a platform follow other members' strategic actions.
First-party complement: a complement provided by the platform owner to its platform.
Freemium: an Internet business model combining free and premium offerings.
Indirect network effect: a network effect between different kinds of user that should not be grouped as one based on their motives or interests (e.g., buyers and sellers).
Installed user base: the number of users who have adopted a given platform.
Inter-operability: compatibility between platforms.
Inter-platform competition: competition between platforms.
Intra-platform competition: competition between same side members of a platform.
Liquidity: amount of interaction occurring between members of a platform.
Monetization: converting free services into revenue.
Multihoming: diversifying strategy of platform members (i.e., both demand and supply side) to commit to more than one platform by utilizing or distributing offerings.
Network effect: the more members/complements in a platform, the more useful it is for its current and future users.
Platform: a place of interaction connecting two or more complementing groups.
Single-homing: committing to only one platform (i.e., opposite of *multihoming*)

Social platform: a platform for interacting with other members due to social motivation.
Standalone value: utility provided by the platform without its complements.
Supply side: complementors of a platform (see *complementor*).
Third-party complement: complements independent of the platform owner.
Two-sidedness: interaction of two groups complementing each other (e.g., buyers and sellers in exchange).
User-generated content (UGC): digital content provided by end users of a platform.
Web 2.0: a term referring to interaction-enhancing features of the Internet.
Winner-takes-all: a competitive case in which the dominant player receives a disproportionally high share of the total gains provided by a platform.

1 INTRODUCTION

1.1 Research background

The development of information technology in the late 1990s resulted in the hype of e-commerce platforms (i.e., two-sided marketplaces connecting buyers and sellers), only to be quickly followed by their demise (Evans 2009a). However, the dotcom period spread seeds of a new beginning, and new platform companies such as Google, Facebook, and Twitter quickly dominated technology users' everyday lives, and created new job types[1] and business opportunities. Many of them also command high returns: Eisenmann, Parker, and Van Alstyne (2011, 1272) found that "*60 of the world's 100 largest corporations earn at least half of their revenue from platform markets.*" The recent surge of platforms has been observed in many industries, and businesses have swiftly adopted the platform strategy and terminology (Hagiu 2009). Concepts such as *network effects* and *critical mass* capture critical ideas relating to platform-driven change in the business landscape.

The impact of platforms can be seen in the speed and scope of their growth. Several platform startups have achieved fast growth and resulted in successful exits for their founding teams (see Table 1).

Table 1 Industry examples

Platform	**Founded**	**Type**	**Exit***
eBay	1995	exchange platform	IPO in 1998
Google	1998	content platform	IPO in 2004
MySpace	2003	social platform	Sold to News Corp. in 2005
LinkedIn	2003	social platform	IPO in 2011
Facebook	2004	social platform	IPO in 2012
YouTube	2005	content platform	Sold to Google in 2006
Twitter	2006	social platform	IPO in 2013

**IPO or trade sale*

The success and vigor of platforms make them an interesting topic to study. As shown by examples in Table 1, it is well established that platform startups

[1] Consider a "search-engine marketer", a profession that did not exist a decade ago.

can be immensely successful. However, it is also commonly known that many, if not the majority, fail. In fact, observations on the hard reality of platform startups are the inspiration for this study. These observations were made in the local startup community in Turku, Finland, and in startup-focused online media, including influential technology and startup-related blogs, such as TechCrunch[2] by Michael Arrington, AVC[3] by Fred Wilson, Startup Lessons Learned[4] by Eric Ries, and also startup-oriented discussion forums such as Quora[5] and Hacker News[6]; all of which include deep and interesting discussions on various startup problems.

Post-mortem stories (i.e., failure narratives) of unsuccessful ventures are of particular interest as they contain descriptions, written by their founders, of problems faced by startups. Reading more than a dozen stories of startup failure raised the author's interest in the topic of failure, which evolved into this study. Focusing on failure was deemed important for two reasons: 1) the early stage of a startup firm is commonly termed the "valley of death" during which many startups fail, and 2) success stories often include a "survivorship bias", as documented in the literature (e.g., Brown, Goetzmann, Ibbotson, & Ross 1992). This reasoning led the author to believe that a better picture of business challenges on the Web could be achieved by studying failures instead of successes. If, indeed, the majority of startups fail, does it not make more sense to study them rather than relying on data from the few successful ones? According to this rationale, failures will help us to understand the Web as a (sometimes hostile) business environment, reasons for why Internet companies fail, and, ultimately, also some potential explanations for the rare successes.

The first focus of the study was on online business models, with the premise that the lack of a proper business model leads to a high failure rate. After an initial inquiry, this assumption was rejected as there were, in fact, a remarkable number of well-functioning business models, created especially after the dotcom bust (see Rappa 2013 for a list). Therefore, it was concluded that the lack of business models probably was not a major explanatory factor. After reading a few post-mortem stories on the Web, the final research plan began to take shape. It was clear that failure is a somewhat complex phenomenon and involves variables at many levels, including commonly cited managerial shortcomings, lack of marketing, and not solving real customer problems (see e.g., Sharma & Mahajan 1980). Indeed, these are quite well understood reasons for failure.

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2 www.techcrunch.com
3 www.avc.com
4 www.startuplessonslearned.com
5 www.quora.com
6 news.ycombinator.com

In contrast, startup-specific business problems had 1) been examined less extensively in previous research, and 2) not been well solved by practitioners, as proven by the failure stories disseminated in the startup community. The study, which initially was to identify critical success factors in different business models that could explain why some firms succeed in online business while others fail, therefore transformed into its current form. In fact, the final topic of platform dilemmas *emerged* from the collected material (cf. Glaser & Strauss 1967) as it became obvious that the majority of startups in the stories were failed attempts to create a platform-based business. This discovery led to synthesizing the practical problems into something more: startup dilemmas, which require deep analysis and creativity to be solved.

Finally, the research conducted here includes a forward approach. Not only were the problems defined, but also their solutions were actively sought by the author while conducting research. McCarthy, Plantholt, and Riordan (1981) wrote in their thesis, "Success versus survival : the dilemma of high technology firms" more than 30 years ago:

> *"The result of [earlier] studies has been to tell the reader:*
> *This is what happened and,*
> *This is how the companies responded.*
>
> *We wanted a study that would tell us:*
> *This is what happened and why.*
> *This is how the companies responded, and*
> *This is how the companies should have responded."*

A similar ambition has driven this study, in that it aims to provide useful insight for founders and researchers by enhancing their ability to identify key strategic problems and their interconnections in platform business.

1.2 Key concepts

The key concepts of this study are defined here. See the glossary for further terminology relating to online business and platforms.

▪ *Startup*: an early-stage business organization. 'Early-stage' is defined as no more than five years of age; 'organization' implies that the startup is not necessarily incorporated; 'business' separates non-profit and open-source projects from commercial ventures; and 'marketing' and 'distribution' refer to the acquisition and serving of customers. In particular, a platform startup is a startup attempting to create a platform-based business.

▪ *Dilemma*: a contradictory decision-making situation in which all alternatives seemingly lead to an undesirable outcome (see Oxford Dictionary 2013). In this dissertation, a dilemma is understood as a conceptualized strategic problem, meaning that it has been given a name and definition. Whereas strategic problems emerge in idiosyncratic situations, dilemmas are generally formulated and, thus, more abstract.

▪ *Strategic problem*: a decision-making problem of a strategic agent; in this study, the platform startup. Strategy is defined in this dissertation as a chosen course of action by a strategic agent that is therefore preceded by decision-making. In general, any behavior that considers costs and benefits and makes a choice, given the available information and assumptions, can be considered strategic (Lyles & Howard 1988). Thus, the pros and cons of strategic problems are required to be weighed (Schwenk 1984). Lyles and Howard (1985, 131) describe these as "*not the everyday, routine problems but the problems and issues that are unique, important, and frequently ambiguous*". In other words, strategic problems can be deep and complex.

▪ *Platform:* a place of interaction (cf. Evans 2003) that connects two or more types of actor. Platforms are often associated with network effects (Katz & Shapiro 1985), critical mass (Rohlfs 1974), and other associated constructs discussed in Chapter 3. Many scholars interchangeably employ the terms *platform* and *two-sided markets* (Rochet & Tirole 2003).

1.3 Research gap

Approximately a decade ago, platforms began to receive the attention of scholars. Entering the vocabulary of economics, two-sided markets (Rochet & Tirole 2003) have become the focus of increased research interest in the field of industrial economics. Related terms such as *app marketplaces* and *ecosystem* have gained popularity in other fields (see Jansen & Bloemendal 2013). Overall, the implications of two-sidedness have spread from economics to other disciplines such as information systems (Casey & Töyli 2012), strategic management (Economides & Katsamakas 2006), and marketing (Sawhney, Verona, & Prandelli 2005).

However, much remains to be discovered, in particular regarding platform development (Piezunka 2011). These issues are more closely associated with the platform business model than generic business problems that can be perceived to apply across industries and firm sizes. Problems such as a lack of marketing, running out of funds, changes in the business environment or macro-economy, or management errors have been considered in the extant literature (e.g., Miller 1977; Gaskill, Van Auken, & Manning 1993; Lussier

1996; Dimitras, Zanakis, & Zopounidis 1996). Similarly, there are multiple studies dedicated to challenges faced by new ventures or startups (e.g., McCarthy et al. 1981; Zacharakis 1999; Honjo 2000; Azoulay & Shane 2001), and also in the online context (Han & Noh 1999; Cochran, Darrat, & Elkhal 2006). |The strategic problems concerning platforms are less well-known. In particular, *five gaps* exist.

First, not much is known concerning platform-specific business problems beyond the chicken-and-egg dilemma. Despite some extensions to other strategic issues (see Chapter 4), the chicken-and-egg problem is perceived as the fundamental issue in platform business (Evans 2002; Rochet & Tirole 2003). However, as this study shows, there are other important problems faced by platform startups.

Second, the perspective taken in the platform literature often neglects the startup condition, mainly regarding the lack of resources or pricing power. This tradition can be seen to stem from Farrell and Saloner (1985) and Katz and Shapiro (1985), often cited by platform scholars, who focus on industry standards and "monoliths", not startup firms. For example, Farrell and Saloner (1986) discuss the "penguin effect" relating to the adoption of standards, implying that none of the players are willing to take the first step. Exceptions in the more recent literature are Caillaud and Jullien (2003), Evans (2009a), Evans and Schmalensee (2010), and Mas and Radcliffe (2011) who consider the chicken-and-egg problem particularly from a startup/entrant perspective. However, when strategies for solving the chicken-and-egg problem focus on pricing (e.g., Caillaud & Jullien 2003) and advertising (see Chapter 4), they might not be effective for startups lacking the means to execute either. Eisenmann et al. (2011) propose envelopment as a strategy for capturing competitors' users (see Chapter 4.7). However, more strategies are needed.

Third, most studies relating to the chicken-and-egg problem are theoretical. Mas and Radcliffe (2011) and Raivio and Luukkainen (2011) are exceptions as they approach the problem through an empirical case study. Curchod and Neysen's (2009) working paper is methodologically closest to this study as it applies grounded theory. Although theoretical and analytical works have a lot of intuitive appeal, empirical studies can help ground their concepts more firmly in the reality of platforms.

Fourth, without closer examination on associated problems relating to its antecedents or arising from its potential solutions, the chicken-and-egg problem is typically treated as being isolated. Such a narrow focus concerns most other strategic problems in the platform literature. Strategy scholars such as Lyles and Howard (1988) discuss interrelatedness of strategic problems. Thus, a more holistic approach that recognizes the relations of strategic problems and their solutions can be perceived as necessary.

Fifth, strategic solutions considered by the economist-dominated platform literature are narrow and focus mostly on pricing (Shy 2011). The importance of pricing in the online environment is negligible as *de facto* pricing of many online platforms approaches zero in terms of both access and usage fees (Teece 2010). Rochet and Tirole (2005), for example, make a case proving that a platform can offer negative pricing to one market side and remain profitable overall as a consequence of what Evans (2003) terms "internalizing the externalities" of platform coordination. However, if entry pricing is set at zero and the platform is *still* unable to attract users (i.e., solve the chicken-and-egg problem), what can be done? It seems that answering this question requires an answer not centered on pricing strategies.

There have also been calls by practitioners for the type of research at which this study aims (The Entrepreneurial Enlightenment 2012):

> *"Most founders don't know what they should be focusing on and consequently dilute their focus or run in the wrong direction. They are regularly bombarded with advice that seems contradictory, which is often paralyzing."*

Consequently, platforms' strategic problems can be regarded as having both empirical and theoretical relevance. In particular, startup founders, managers, and investors are interested in learning more concerning specific challenges of platform companies, as such insight can offer competitive advantage in their respective markets.

1.4 Purpose and research questions

This purpose of this study is to address some of the previously mentioned research gaps with appropriate research questions, and, in so doing, improve the chances of platform startups to identify and solve central strategic problems pertaining to the platform business model, thereby also increasing their chances of survival.

Although platform startups are currently flourishing in the online market space, every platform must bypass its early stage to become a viable and profitable business. Therein lies the problem, as most startups ultimately fail (Haltiwanger, Jarmin, & Miranda 2009; Watson & Everett 1999). To the author's knowledge, whether platform businesses have a higher or lower failure rate than other types of business has not been studied; however, startup ventures tend to generally suffer from high failure rates. It can be assumed that platform startups are no exception in this sense, and thus studying their problems forms the research purpose of this study.

The research problem can be formulated as the following research questions[7]:

RQ 1: What strategic problems are encountered by early-stage online platforms?
RQ 2: How can the problems be conceptualized as dilemmas?
RQ 3: Are the dilemmas interrelated? If so, how?
RQ 4: How can the platform literature and founders' experiences help solve the dilemmas?

The research questions therefore relate to strategic problems of platform startups, which are conceptualized as dilemmas. The interrelations of these dilemmas are examined, and the study analyzes their potential solutions. Due to the aforementioned high failure rate, it is meaningful to conduct such a study that aims at improving the survival rate of platform startups by providing knowledge on potential challenges they are likely to face, and also offering a basis for solution building.

By asking the first research question, the study extends beyond the chicken-and-egg problem, and shows that there is more depth and complexity in platform dilemmas than is generally considered in the literature. The study challenges the simplification of "*getting both sides on board*" as a solution (Evans 2002), and argues that even if this is accomplished, a platform does not necessarily fulfill its economic goals in terms of becoming profitable. The study investigates solutions beyond pricing and subsidies that are more suitable for startups, given their constraints of time and resources. It is particularly useful to see how theoretical approaches match the reality of startup founders, and therefore the examined solutions stem from both the literature and empirical material.

The second research question addresses conceptualization, which is a form of abstraction; that is, moving from the particular to the general. Conceptualization facilitates 1) communication of strategic problems, 2) their further treatment, and 3) theory generation. Communication of novel concepts takes place both among practitioners and scholars. When a theoretical concept has reached a state of general knowledge within a field, communication relating to the phenomenon becomes more efficient and advanced (Hunt 2002). The benefits of conceptualization relating to further treatment can be seen, for example, in the famous prisoner's dilemma (Axelrod 2006); defining this

[7] Note that, due to the inductive nature of the study, the precise questions were formulated after the analysis. Whatever their initial form, theoretical sampling of grounded theory tends to reshape research questions (Urquhart, Lehmann, & Myers 2010).

problem and labeling it as it is has led many scholars to attempt to create variations, find solutions, and apply it to different contexts. According to Glaser (2002), conceptualization precedes theory generation, and is therefore *sine qua non* in academic work. Instead of constantly reformulating the same problem, practitioners are able to identify the situation in other contexts, and therefore also consider general and particular solutions, proposed by others, in their own context. In sum, conceptualization of startup dilemmas can assist in bringing these benefits jointly to scholars and practitioners.

Furthermore, the identification, conceptualization, and analysis of platform-specific strategic problems is a worthwhile research purpose because the formulation of strategic problems influences the solution process[8] (Ackoff 1969; Lyles 1981). As pointed out by strategic management scholars, strategic issues are rarely isolated cases, and merit a wider perspective (Lyles & Howard 1988). By thoroughly understanding the problem and its associations, founders are able to elicit appropriate solutions (Lyles 1981). By careful conceptualization (i.e., naming and defining) of the strategic problems, this study raises the abstraction level and provides a deep insight on them.

Although this study does not show exact relationships between specific problems and outcomes, based on the material, it assumes that strategic problems impact the failure outcome; that is, discontinuance of business (Watson & Everett 1993). The following figure displays the idea of a *black box* between the startup beginning and the failure outcome, of which the strategic problems are a part.

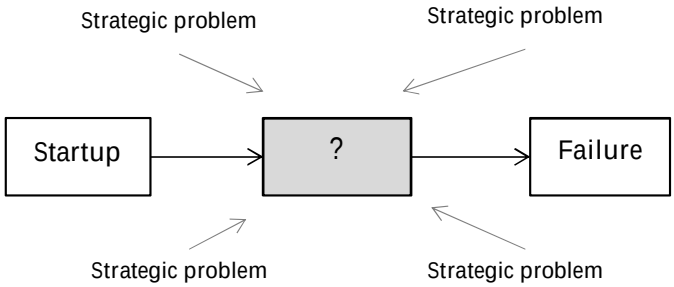

Figure 1 Black box of startup failure

Solving strategic problems, therefore, is part of the process leading to the outcomes of success or failure. Inference can also be drawn from Pawson and

[8] Ackoff's (1969) *elevator problem* is a good example: if waiting for an elevator is defined as a technical problem, the company needs to engineer faster elevators. If, however, it is defined as a behavioral problem, people can be given an activity while they are waiting.

Tilley's (2009) model by stating that, in the *context* of online startups, strategic problems act as *mechanisms* to the *outcome* of failure. Adopting this logic highlights the importance of strategic problems as a research problem; as they are assumed to be associated with failure, the ability of a firm to identify and solve them through correct strategic choices is likely to have a positive impact on the firm's survival. In other words, solving all issues leads to a viable platform in terms of both interaction and revenue.

To accomplish its purpose, the study is based on empirical evidence from early-stage startups, not on incumbents or established industry firms that already have a stable position in the market, and can afford to solve the chicken-and-egg dilemma and other strategic problems by mass marketing or other resource-intensive approaches. Therefore, the focus of the study is on early-stage online startups that employ the Internet as their marketing and distribution channel, and follow the platform business model by enabling interaction between two or more groups of users. The units of analysis are failed early-stage Internet startups, and the empirical material comprises 29 post-mortem reports by founders of failed Internet startups, originally published on the Web (see Chapter 2). The material is analyzed by employing GT in an attempt to answer the research questions, and thus fulfill its purpose.

The importance of the research purpose can be shown in many ways. Generally, it is accepted that startup companies are important for the economy (Audretsch & Acs 1994): they create a large share of new jobs (Kane 2010), develop innovations to improve people's lives (Almeida, Dokko, & Rosenkopf 2003), redeploy resources by creative destruction (Schumpeter 1961), fill gaps in customer needs, and tackle problems efficiently and relentlessly from new perspectives (Shepherd & Kuratko 2009). Therefore, a study aimed at improving the conditions upon which startups will thrive can be regarded as important for 1) the society in general, 2) entrepreneurs and managers of platform startups, and 3) investors seeking the best investment opportunities among competing ventures.

At the same time, the research focus excludes particular types of issue outside its scope. Because the study focuses on problems of early-stage platform startups on the Internet, other types of platforms and problems are beyond the scope of this study. The excluded platforms exist in various forms; for example, shopping malls, credit cards, and newspapers (Rysman 2009). Their problems might be different from those of online platforms. Other excluded problems include, for instance, general managerial problems (e.g., lack of experience) and general startup-related problems such as *liability of newness* (Stinchcombe 1965). Details on how the researcher narrowed the focus on particular dilemmas can be found in Subchapter 4.3.2.

1.5 Positioning

This study is positioned to the platform literature, and particularly to its strategic management stream (i.e., *strategic management of platforms*). Figure 2 demonstrates how the platform literature is understood in this study.

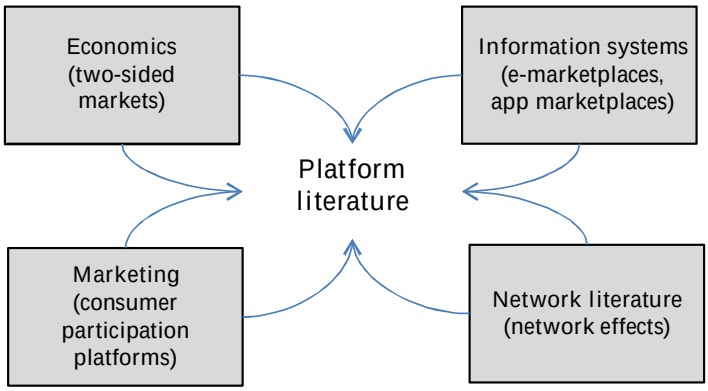

Figure 2 The platform literature

As depicted in the figure, the platform literature comprises:

- *Economics* literature specializing in two-sided markets (i.e., two-sided platforms; multisided platforms).
- *Information systems* (IS) literature relating to electronic marketplaces and mobile application marketplaces.
- *Marketing* literature focusing on consumer interaction within platforms.
- *Network* literature on network effects and platform/network structures.

It is argued here that all of the previous streams contribute to the strategic management of platforms, which also includes their design (Bakos & Katsamakas 2008). A discussion on their contents and key areas of interest follows.

It transpires that platforms are studied across disciplines. Rochet and Tirole (2003) form the basis of the economics literature on two-sided markets. This research tradition can be seen to originate from prior studies on network effects, standards, and technology adoption (Church & Gandal 1992; Farrell & Saloner 1985; Katz & Shapiro 1986). The economists' agenda often relates to pricing, regulatory issues, and antitrust policies (Rysman 2009). However, it

also relates to network effects that stem from the earlier literature on network effects (Katz & Shapiro 1985), critical mass (Rohlfs 1974), and 'tipping' (Shapiro & Varian 1998).

In particular, the concept of tipping has been applied to inter-platform competition, underlying the idea of Internet markets as winner-takes-all markets (Noe & Parker 2005). Whether two-sided markets result in quasi-monopoly situations and whether this is good or bad (Luchetta 2012) are central questions in this debate. Subsidies can be regarded as "dumping" in a one-sided market, whereas they can be regarded as a necessity for creating liquidity in a two-sided market (Evans 2009b). Another notable aspect for economic analysis is that, in two-sided markets, both price levels and their structure are significant (Rochet & Tirole 2003). For example, a sub-optimal solution in one side (e.g., price subvention) can result in an improved overall solution regarding the two-sided structure (Evans 2003). Thus, the economists' agenda links with themes such as pricing, inter- and intra-platform competition, coopetition, and monopoly (Roson 2005; Birke 2008; Shy 2011).

Second, *network theorists* tend to consider one-sided platforms in which all users are the same type (Wright 2004). This makes sense as they are interested in graphing the network (Viégas & Donath 2004) or examining the diffusion process (Valente 1995), and not necessarily the transactional implications or quality of interaction occurring within the platform. Structurally, platforms can be perceived as networks of connected actors, or "nodes" (Banerji & Dutta 2009). Rysman (2009, 127) notes that although, technically, the economics literature on two-sided markets can be regarded as "*a subset of network effects*", it tends to focus on pricing, whereas studies on network effects "*typically focus on adoption by users and optimal network size*." In any case, network effects in their positive or negative form remain a central concept (Shy 2011).

The contribution of network theory to the platform literature is exemplified by Westland (2010) who combines network laws with willingness to pay. Network theory does not usually consider strategic dimensions of platform management or two-sided implications; rather, it is interested in describing various network structures, and explaining their growth and diffusion (e.g., Westland 2010). The overlap in the interests of network and platform theories can be seen in adoption or diffusion. Although adoption can be studied from a social perspective in line with Rogers' (1995) seminal book, network theory tends to focus on descriptive models as opposed to theorizing on the reasons for diffusion/adoption. A different subset of studies from the information systems (IS) tradition relates to technology acceptance, such as the technology acceptance model (Venkatesh & Davis 2000). These approaches have not been considered in the platform literature that perceives network effects as the main

driver of adoption (Katz & Shapiro 1986), and, although they might provide valuable insight on the complexity of adoption, they are also not considered in this study.

Third, regarding the IS literature, Hyrynsalmi et al. (2012), Salminen and Teixeira (2013), and Jansen and Bloemendal (2013, 3) address the recent stream of mobile application marketplaces which they define as "*an online curated marketplace that allows developers to sell and distribute their products to actors within one or more multi-sided software platform ecosystems*". The focus has shifted from e-marketplaces (i.e., late 1990s to early 2000s) to app markets. This shift has followed the change in business markets as especially consumers have adopted various app stores, and their significance has therefore increased (Hyrynsalmi et al. 2012). The focus of earlier IS research was often on business-to-business (B2B) exchange platforms, and especially on the concept of liquidity (Evans 2009a). Contrary to earlier e-marketplace research, modern app markets such as mobile phone applications are typically business-to-consumer (B2C)-oriented (Jansen & Bloemendal 2013). A survey on the electronic marketplace[9] literature can be found in Standing, Standing, and Love (2010).

Fourth, marketers are interested in platforms. In 1998, Sawhney had already highlighted the importance of moving from portfolio thinking to platform thinking in his commentary for the *Journal of the Academy of Marketing Science*, and argued that "*marketers who master platform thinking may find the 21st century to be a somewhat more inviting prospect*." Generally, the marketing literature tends to focus on the consumer perspective of platform interaction and strategies relating to marketing problems such as finding and influencing particular lead users to propagate messages (Hinz, Skiera, Barrot, & Becker 2011) or otherwise participate in platform interaction: co-creation platforms (i.e., firms leveraging consumers in their value-creation activities) or peer-marketing platforms for customers voicing their opinions. Hennig-Thurau, Gwinner, Walsh, and Gremler (2004) studied consumer opinion platforms, combining virtual communities and the traditional word-of-mouth literature. In particular, seeding is regarded as a viral marketing strategy to attract the most prominent users to join a platform (Hinz et al. 2011). Marketing studies overlap with network studies that aim to find the most influential "nodes" (Hill 2006). However, marketing adds the actual persuasion of these nodes to join the platform as "real people". Another special interest of marketers is the relationship between a platform owner, advertisers, and

[9] As discussed later, marketplaces are a *special type*, but not the only type, of platforms relying on economic exchange as the form of interaction. For other types of platform, the interaction might take a different form.

consumers in an advertising-enabled platform (e.g., Salminen 2010; Reisinger 2012).

Sawhney et al. (2005) examine the Internet as a platform for value co-creation with customers. This collaborative innovation can take advantage of the Internet's distinct features and be exploited, for example, in new product development. Cova and Dalli (2009) discuss how marketing theory is developing towards working consumers as it focuses on value co-creation and customer participation. Platforms seem to offer opportunities for marketers to leverage and monetize customer input, and marketing scholars have been showing interest in *crowds* (Howe 2006) as resources. While marketing studies tend to be applied, the idea of consumers as an extension of the firm can be perceived, at a higher abstraction level, as linking to the Coasean theory of the firm (Coase 1937) and transaction cost analysis (Williamson 1981). The overlap shows how economists and marketers are often interested in the same phenomenon, although at a different degree of abstraction. In platform terminology, customer participation can be expressed with the concept of user-generated content (UGC), or actions of a platform's users, such as participating, writing, uploading, and sharing (Daugherty, Eastin, & Bright 2008). As most of the studied startups apply user generation (UG), this dissertation considers implications of the UG model. However, matching the approach with marketing research (e.g., customer participation) is left for future studies.

The strategic perspective, taken by this study, is to conceive and evaluate strategic choices for platform stakeholders (cf. Cusumano 2010). As a perspective, it is not limited to any discipline but to all related works that perceive actors as strategic in a platform context. While a lot of attention has been paid to the platform owner's perspective (Birke 2008), including management of an installed base of users, standards, and complements (McIntyre & Subramaniam 2009), research also discusses other stakeholders' strategies, such as those of software developers (Salminen & Teixeira 2013), that is, complementors. In addition, platforms' end users are mostly assumed to react to pricing (e.g., Rochet & Tirole 2003), the number and quality of complements, and network effects; in other words, the presence of other users (Evans 2002). Of special interest is users' *adoption choice*, which is perceived to be constrained by exclusivity versus diversification (Roson 2005) and resource constraints (Iacovou, Benbasat, & Dexter 1995).

Multihoming, the practice of participants to diversify their investments across platforms, is an example of the strategic perspective in the platform literature (Armstrong 2006). Such behavior can be seen to occur in both the supply- and demand-side, and its feasibility relates to cost functions; namely, whether it is wise to commit to several platforms in terms of time, effort, and financial cost, or whether focusing on one platform is sufficient to satisfy the

participant's goals. Multihoming has been studied, for example, by Hyrynsalmi et al. (2012) in mobile application markets. Another example of the strategic perspective is the analysis of open versus closed platforms; that is, which setting is more suitable for the platform owner/complementor (Boudreau 2010; Eisenmann, Parker, & Van Alstyne 2009; Gawer & Henderson 2007; Parker & Van Alstyne 2008). The strategic perspective therefore focuses on platform stakeholders' choices in reaching particular goals and outcomes. An overview of strategic problems in the platform literature can be found in Chapter 4.

Due to the focus on startup dilemmas, or contradictory decision-making situations, this study is particularly positioned to the strategic management stream of the platform literature. However, the study utilizes the related literature such as economics papers with a strategic focus; for example, determining the correct pricing, design, entry strategy, and subsidization. Such aspects can contribute to solving startup dilemmas relating to online platforms. The strategic perspective does not in itself exclude any actors as they can all behave strategically; users consider their own benefits, as do platform owners and complementors.

Perhaps the distinctive feature here is that the question of *which actors to examine* varies across streams of the platform literature. As economists are interested in markets, they tend to examine buyers and sellers, or demand and supply sides (Evans 2009a). IS researchers are currently paying increasing interest to app marketplaces, so their two sides comprise app developers and end users (e.g., Mian, Teixeira, & Koskivaara 2011). The strategic choice of a marketing manager is how to allocate marketing budget (Fischer, Albers, Wagner, & Frie 2011), whereas it is the CEO/founder's problematic role to organize the whole business. This study takes the latter perspective and focuses on dilemmas that are inherent to the startup's business strategy, and not only to its marketing strategy, pricing, or capability to attract developers. The perspective is that of the startup/founder: *What can it/he do to solve the startup dilemmas and avoid failure?*

In sum, it can be seen that platform studies across disciplines are interrelated and contain overlapping interests. For example, marketers are interested in graph theory to find potentially influential users, and economists and marketers share the interest of users/customers as "resources" or assets of the firm. The chicken-and-egg problem is common to all; as economists aim to solve it through pricing while marketers propose sales and persuasion as the solution, these studies underlie adoption as the fundamental phenomenon. In a similar vein, a strategic focus can be found across disciplines; it is more dependent on which strategic problems within the platform are of interest to scholars and what kind of solutions they examine. The present study focuses on strategic

problems grounded on the material, and can be perceived as critical for the survival of platform startups on the Internet.

1.6 Structure

The study proceeds as follows. Chapter 2 describes the methodology, including research strategy, research process, data collection and analysis, and also the literature approach. The theoretical framework, including conceptual underpinnings and their connection to platform literature, is discussed in Chapter 3. This chapter defines platforms as a concept, explains particularities of online platforms, and presents critical assumptions; namely, user-generation effects, which will be referred to in the empirical part.

Startup dilemmas in Chapter 4 contain the empirical part of this study, and are based on post-mortem stories written by founders of failed startups. The chapter investigates specific problems of platform startups that are conceptualized into dilemmas and then analyzed with the help of the platform literature. The treatment of each dilemma is divided into four sections: definition and exhibits, literature review, potential solution, and overall discussion. Chapter 5 elaborates further solutions based on the second-round analysis, arising from both the empirical material and the scholarly literature. Finally, Chapter 6 presents the contribution to theory and practice, further research ideas, and evaluates the credibility of this study.

2 METHODOLOGY

2.1 Research strategy

2.1.1 Introduction to research strategy

This study aims at the creation of substantive theory (Glaser & Strauss 1965) relating to strategic problems of platform startups on the Internet. This is accomplished by conceptualizing and increasing the abstraction level of the analyzed post-mortem stories. The grounded theory (GT) methodology, outlined by Glaser and Strauss (1967) is applied as an instrument of data collection and analysis. The following sections explain the method, why it was chosen, and how it was applied throughout the research process.

2.1.2 What is GT?

Grounded theory is a *set of methods* to systematically analyze empirical material (Finch 2002). This data can be both quantitative and qualitative (Glaser 2004), although GT is most often associated with qualitative data (Kempster & Parry 2011). Partington (2000) notes that the foundations of GT include *theoretical sampling*, or a process of data collection guided by the emerging theory and *constant comparison*, or simultaneous coding and analysis of data. Suddaby (2006, 634) confirms this perspective, and adds that "*[b]oth concepts violate longstanding positivist assumptions about how the research process should work*." This contradiction relates to the method's history of countering deductive methods in favor of theory generation from data (see e.g., Locke 1996, for a more detailed discussion). The coding process if more thoroughly discussed in Chapter 2.4.

By nature, GT is an *inductive*[10] method, intended to help the researcher elicit answers to his or her research problem from the empirical material (Eisenhardt 1989). Contrary to deductive reasoning, in which the presumptions are stronger and the researcher is narrowing the scope of

[10] Note that by 'inductive method', an inductive *tendency* or emphasis is implied. Pure induction and pure deduction, for that matter, are generally considered impossible; new ideas arise from their combination, or *abduction* (Suddaby 2006).

inquiry, in inductive logic, the scope of inquiry is broader and central issues are gradually revealed by scrutiny, which in GT is represented by the coding process (Strauss & Corbin 1994). Eisenhardt (1989, 541) points out that, in inductive studies, "*researchers constantly compare theory and data-iterating toward a theory which closely fits the data*." This fit between data and emerging concepts is perceived as important because it reduces the risk of the latter being detached from empirical relevance (Eisenhardt 1989).

In contrast, by employing *hypothetico-deductive logic*, the researcher first develops hypotheses; that is, assumptions concerning what is likely to happen or be found in the analyzed data (Laudan 1981). After this, the hypotheses are tested with a specific method such as experiments or statistical analysis, and the results are discussed. The hypotheses are created either by observing real-world phenomena or by analyzing the literature for theoretical gaps (Davis 2009). Grounded theory differs from this logic in at least three aspects.

First, there are no initial hypotheses that prove, disprove, or generate a theory, and the theory is generated with the fewest presumptions possible (Glaser & Strauss 1967). Second, GT does not rely on identifying a theoretical gap prior to analysis (Heath & Cowley 2004). The defense of the method comes from the self-proclaimed novelty of the phenomenon and idiosyncrasy of the utilized material, as a consequence of theoretical sampling. The self-proclaimed novelty implies that there is indeed some reason for inquiry as not all is yet known (Pandit 1996). This derives either from uniqueness of the data or from newness of the phenomenon[11]. Although the literature is not employed as a starting point, the relationship to previous theory needs to be considered, and this is done subsequent to data collection and analysis (Goulding 2005).

According to Glaser (1978, 51), "*[r]eading the theoretical literature should be avoided when possible until after the discovered framework is stabilized*". Therefore, in GT, the literature review is conducted after the formulation of categories, which might seem unconventional for researchers trained only on hypothesis testing (Kempster & Parry 2011). Finally, whereas research questions in hypothetico-deductive studies tend to be fixed, GT allows for changing the initial questions if found irrelevant in the field (Charmaz 1990). Such flexibility is advantageous for theory generation as it reduces the impact of preconceived constructs and encourages the discovery of new concepts.

Two points emerge from the previous explanations. First, it was posited that GT is inductive by *nature*; second, there are no *initial* hypotheses. The two words, emphasized in italics, have important implications. The nature of GT is not pure induction, but more of abduction (as so-called inductive studies tend

[11] For example, one cannot have conducted research on Web 2.0 startups prior to 2005 because the concept did not exist. Thus, a substantive theory is a contemporary outcome, placed in time.

to be). This means deductive reasoning is employed in the course of the research; but there is a strong emphasis on "letting the data speak for itself" (Glaser 1978), as opposed to forcing it into preconceived hypotheses. However, over the course of the research process, central themes become more apparent, at which point the researcher is encouraged to compare new findings with intermediary conclusions; this is a form of deductive reasoning.

As an example, consider the following observation: "*A cat is in a tree, because a dog chased it there*." The researcher can employ this piece of data to formulate a general hypothesis: "*Dogs don't like cats*." To confirm this hypothesis, however, he needs to conduct theoretical sampling. Thus, he seeks more empirical descriptions on the relationship between cats and dogs, and discovers the following description: "*Today it was so nice to come home and see my cat Jim and my baby dog Bozo asleep in the same basket*." Aha! Cats and dogs can get along, so the original hypothesis is incorrect. This method of comparing new and previous data through tentative assumptions enables correction and modification of our hypotheses. For example, we can observe a specific condition and say that "dogs don't like cats, unless they are accustomed to them from an early age", and then seek to validate or refute this hypothesis through theoretical sampling. This simple example shows how hypotheses emerge from the analysis of *data*, not precognition; in other words, they are grounded (Glaser & Strauss 1967).

Due to the somewhat vexing issue of induction/deduction, the GT method can be best labeled as data-oriented. The rationale of data orientation is to *connect theory with the real world* (Glaser & Strauss 1967). In other words, if the only way to generate new theory were to examine existing theory, one would never originate ideas "outside the system". In contrast, the source of theory can be *in praxis* or, in effect, the data, as opposed to its fitting into *a priori* theoretical framework. Here it is not claimed that one or the other is better; in the author's opinion, the research gap can be found both in the literature and *empiricism.* For the latter, the challenge is to ensure the phenomenon has not been exhausted prior to engaging deeply in research activities[12] while, for the former, it is to ensure the topicality of the research purpose in real life. Overall, GT aims to avoid theoretical exercises detached from real problems (Glaser & Strauss 1967).

Thus, ideas come from informants themselves and are labeled to match their use of language in vivo (Charmaz 2006). The sense-making of the informants is translated by the researcher to match the discourse in the

[12] This would waste resources as enough is already known on the topic, and the researcher would be unable to provide new insights. In practice, however, novelty is debatable as many phenomena occasionally reoccur in the literature without being rejected.

academic literature. This matching process is a requisite for a) finding the theoretical discourse in which the study can be positioned, and b) formulating the theoretical contribution by employing established research language and concepts (McGhee, Marland, & Atkinson 2007). If this translation is not performed adequately, the researcher risks remaining isolated from academic discourse. The successful employment of GT results in a theory with unique aspects, although parts of it might overlap with existing theory (Glaser & Strauss 1967)[13].

2.1.3 Why was GT selected as research method?

First, the researcher was interested in problems of post-dotcom Internet startups, a phenomenon not well studied (see Chapter 1). When there are no exact presumptions and the research topic is quite new, a method aiming to *discover central topics* is beneficial (Glaser 1978). According to Finch (2002, 220), grounded theory fits well with "*the development of novel knowledge claims of under-researched phenomena*." As identified in the previous chapter, there are several gaps relating to platform-creation activities, and managers actively seek to understand why particular strategies work while others do not. To determine the answer, theoretical analysis is needed.

Grounded theory (GT) is particularly useful when data are in qualitative form and the researcher still seeks a systematic methodology (Glaser 2004). GT gives good grounds for conceptualization and raising central topics and patterns from the data (Charmaz 1990). These features are compatible with the objectives of this study; thus, GT provides a good methodological match for solving the research problem.

Second, the richness of the type of data on which this study is based is simultaneously both an advantage and a disadvantage. Qualitative data requires a significant amount of sense-making and structuration (Suddaby 2006); however, the reduction process offers good grounds for theorization (Miles & Huberman 1994). These properties support the choice of a method that aims to generate explanations from data. GT is compatible with this need because it is presented as a systematic method of analysis (e.g., Glaser & Strauss 1967; Eisenhardt 1989; Kempster & Parry 2011) and often applied to qualitative data (Goulding 2005).

Third, GT seemed a good fit for the author's tendency to conceptualize. Heath and Cowley (2004) argue that the researcher's cognitive style should

[13] Of course, the researcher needs to identify these overlaps and position his/her contribution towards the extant literature. However, this process can take place *after* the analysis.

play a role in the selection of method. As explained in the previous chapter, the research began with qualitative material from failed startups. The analysis started by finding general themes in the material. As knowledge on different methods increased, the author understood that he was in fact *coding* (e.g., Strauss & Corbin 1994). Shortly thereafter, the author learned about grounded theory. As the method corresponded to the approach taken up to that point, it was not a large step to adopt GT's principles.

Fourth, the research construct, strategic problem, is not a fact that can be quantified, observed, or measured as a variable in an empirical model. Nor can it be regarded as a latent variable that might be constructed by utilizing other variables; at least, not without complex interpretations. Rather, a strategic problem is a concept, or a conceptual construction of reality. This study assumes that strategic problems exist in the real world and, once defined in the correct strategic situation, can be perceived as a relatively stable form of reality by all interpreters with adequate understanding on their nature. Thus, strategic problems are situational patterns that emerge when specific contextual conditions are met. Such an ontological position implies *critical realism*, in which real events remain dormant until triggered by particular conditions, upon which they become actual and, if observed, empirical (Partington 2000). To produce such understanding that is required to identify and explain strategic problems – as it is not obvious that everyone, even experienced managers, will identify them *a priori* – GT has to offer a set of highly useful principles.

Fifth, GT enables an easy expansion from one topic dimension to another, not being required to remain within the scope of the initial data (i.e., "all is data"). In this study, this feature of GT shows in expansion from problems to solutions; that is, additional interviews focusing on solutions and analysis of online material relating to them. The approach is much different compared to research designs where the data are static (i.e., remains as what is collected) and then is employed to answer *a priori* research questions. In GT, *a priori* research questions can change. In this study, the focus changed from business models to failure to strategic problems, and was finally annexed by the discovery of solutions. Therefore, GT's approach to see "all as data", in addition to its flexibility in terms of theoretical sampling and constant comparison, encouraged the researcher to be led by the phenomenon instead of his initial preconceptions.

Relating to strategic issues of platforms, Gawer (2009) highlights the importance of a firm's capabilities and also industry- and firm-specific circumstances; that is, the *context*. An emphasis on context supports the choice of GT as a methodology, as it is often applied to generate understanding on a research problem in a particular context (Chesler 1987); that is, a *substantive theory* (Glaser & Strauss 1965). For example, Orton (1997) reported the use of

GT in studying strategic change processes in loosely coupled systems. Kan and Parry (2004) examined resistance to change in a hospital setting, and identified paradoxical thinking as an influencer. According to Wagner, Lukassen, and Mahlendorf (2010, 9), "*grounded studies are especially appropriate for gaining an initial understanding of complex transitions*"; arguably, strategic problems associated with startup failure can be categorized as such.

The extant platform literature has approached the chicken-and-egg problem (i.e., *getting both sides on board*) mainly from the pricing perspective, and focused on analytical modeling (Piezunka 2011). Few inductive studies have been conducted to understand the roots of the problem, or how it might be solved (e.g., Birke 2008). This study provides a step in that direction. As will be shown, mere pricing (i.e., levels or structure) is insufficient as a solution to the cold start problem; in fact, several studied startups offered their products *for free*, and still failed to gain growth. The lack of participation is only partially explained by overly high prices; fundamentally, it is a much more complex phenomenon. This study is geared towards the interpretations of failed startup founders. In these stories, founders explain why their ventures failed. The inductive nature of the study will provide a needed empirical grounding for the treatment of strategic problems.

2.2 Research process

This chapter describes how the study was conducted, and how it evolved over the course of the analysis. Figure 3 depicts the research process.

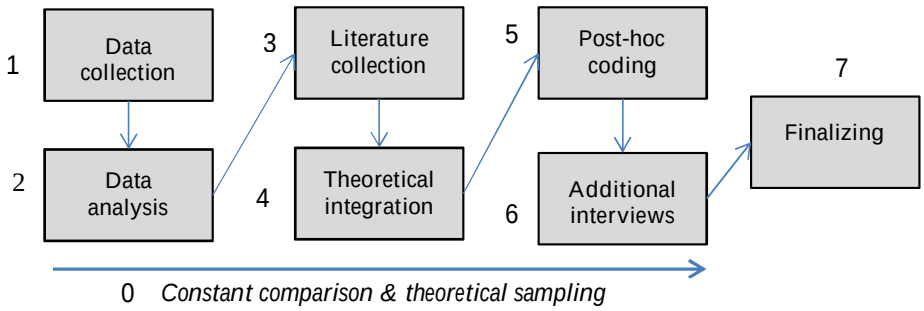

Figure 3 Research process

First, post-mortems were collected through online searches and by following links from aggregators and curators of post-mortem stories [1]. Note that

post-mortems represent first-hand data for the analysis, whereas other readings and discussions with founders in various startup events correspond to theoretical sampling of GT [0]. In turn, adjusting the learning from the literature, discussions, and interviews to preliminary findings corresponds to constant comparison of GT [0].

In the first phase of data collection, everything relating to failure of Internet startups was retrieved. In the second phase, criteria for inclusion and exclusion were developed and narratives were filtered, which is explained in the following subchapter. In total, 29 failure narratives remained at this point. Then, to analyze the material [2], several phases of coding were conducted according to the GT method (see Subchapter 2.4).

During the coding phases, strategic problems emerged as the key theme of the study. Thereafter, the conceptualization of the dilemmas began. At this point, various streams of the literature were collected and read [3] to determine the study's theoretical framework positioning. Note that at this stage, several alternatives for placing the findings in the literature existed. The studied research streams comprised the literature focusing on business models, business failure, and platforms (two-sided markets). Eventually, based on the author's judgment, it was decided that strategic problems of the studied startups, conceptualized as "dilemmas", had most in common with the platform literature. The research focus was therefore narrowed down, and a systematic integration of the platform dilemmas into the extant literature began [4].

Consequently, a more thorough retrieval and review of the platform literature began (see Chapter 2.5). The researcher made multiple searches and collected the literature by snowball sampling the found papers. The literature was read keeping the theoretical constructs (i.e., dilemmas) in mind, and the synthesizing of startup dilemmas and the platform literature began. This process is described as *theoretical integration* by Urquhart, Lehmann, and Myers (2010). Commonalities with the findings and extant theory could be found quite easily, which reassured the researcher that the correct literature had been chosen. In other words, the literature and empirical accounts seemed to discuss the same phenomena, despite utilizing different words.

In general, conducting the literature review and positioning after the analysis is in strict accordance with the principles of GT (Strauss & Corbin 1994; Glaser 2004). Such a choice is intended to facilitate inductive theory formation: that is, to avoid preconceptions arising from the literature to shape the conceptualization, understanding, and interpretation of the initial findings to the degree where their originality is lost.

The author found it purposeful also to consider some potential solutions in addition to the extensive analysis of the problems. However, solution finding

is an extension to the work; its main focus is on the dilemmas. To find additional solutions to the dilemmas, two steps were taken. First, *post-hoc coding* was conducted after the literature analysis [5]; this time focusing on solutions to the dilemmas. This step included coding of the original material for "what if" statements in which the founders expressed what they would have done differently, had they been given the choice. Second, the author decided to utilize the principle of theoretical sampling by conducting additional interviews [6] with founders.

After these efforts, the report was finalized [7]. The report was written in a conventional format, outlining research questions, then methodology, the literature, and results. Suddaby (2006) mentions that this is a common way to report a GT study. Although the exact research problems were formulated *ex post*, presenting them in the introduction helps readers understand the study's purpose. The study itself began with no preconceived theory, as is the case with GT studies (Glaser & Holton 2004), and the research gap or research problem did not initially exist in the way described in Chapter 1. Prior to the analysis, the researcher was interested in a different purpose than that which emerged from the material over the course of the analysis. However, Suddaby (2006) notes that although it can at times seem confusing, reporting GT by the conventional "deductive study structure" is normal.

2.3 Research data

2.3.1 Data collection

The analyzed material comprises 29 failure reports by founders of failed startups. The narratives, or "post-mortems" as termed by startups, were written by founders to reflect the startup's failure, in particular to identify reasons for that failure. Thus, post-mortem is defined here as *a story analyzing a failed startup venture*. The stories were collected from the Internet by following links from various blog articles listing and publishing post-mortem analyses, and conducting searches via Google search engine and two startup-centered online communities.

Keyword phrases for Web searches included:

- startup failure story
- startup postmortem/post-mortem
- startup failure analysis
- business postmortem/post-mortem
- business failure analysis.

The data collection process began by gathering all post-mortem stories the researcher could find. The search was conducted by finding aggregated blog-posts listing startup failure stories and then following links to original posts, similar to "snowball" sampling (see Biernacki & Waldorf 1981), and by performing Web search queries. In particular, ChubbyBrain (2011) contained links to several post-mortem stories. Following links, post-mortem stories were captured for further filtering and analysis. Additionally, Google[14] was utilized to find post-mortems; this is because Google's search algorithms tend to be the most accurate of current search engines (Uyar 2009), and its index of Web pages is commonly judged as current and extensive (e.g., Gulli & Signorini 2005).

Moreover, searches were conducted on two startup-focused online communities: Quora and Hacker News. These communities contain a substantial number of discussions relating to Web startups, and also included discussion threads on startup failure. Reading these discussions helped the researcher to become familiarized with the phenomenon and find links to still new post-mortem stories.

In addition to reading the post-mortems, the author sought additional ways to deepen his knowledge on the startup industry or, as it is commonly termed, the "startup scene". The steps for doing so comprised the following.

First, approximately a dozen interviews by a startup-focused journalist Andrew Warner[15] were read. As these interviews were freely available on the website in transcribed form, they were read to find confirmation, contradiction, or complements to the post-mortems' findings. The interviews were a good source of secondary data because they included both successful and failed startups, and therefore provided useful background information on the industry and the startups' founders' decision-making and ways of thinking.

Second, to deepen the knowledge on the sampled startups, the comment sections of the post-mortem stories were read; the stories were published in blogs, and therefore could be commented upon. There were some cases in which other founders participated by questioning parts of the analysis or by sharing their own stories. In addition, in a couple of cases, customers disagreed with the story, and also the content suppliers of one startup were bitter (i.e., in platform terms, the "other side"). Although fascinating, analyzing the discourse between founders and other interpreters was not the goal of this study, so the researcher did not go deeply into the question of "who is right".

[14] www.google.com
[15] www.mixergy.com

However, familiarization was enriched when founders' replies brought further clarification to the cases.

Finally, six additional interviews were conducted with founders. Each of the interviews lasted for approximately an hour and was theme-based, the theme being the strategies and tactics the founders had employed, or knew about, in solving the chicken-and-egg dilemma. The founders were asked questions such as "How are you solving the problem for side A(/B)?", "What is your most successful (/unsuccessful) solution?", and "How are you planning to grow in the future?" All founders were knowledgeable of the topic, and could express advanced ideas relating to it. During the interviews, the author made notes and mentally compared the emerging points to previous findings. Later, the notes were integrated into the solutions section of this study.

Although the process of theoretical sampling can be continued for a very long time (in fact, infinitely), within the frame of this study (i.e., its focus on dilemmas; time constraints) six interviews, in addition to post-hoc coding, were regarded as adequate for the discovery of solutions. Due to GT's acceptance of additional data collection and its comparison to earlier findings, and also its acceptance of different types of data, the research process can be continued in the future.

2.3.2 Selection criteria

All post-mortems were filtered for further analysis. The selection criteria comprised:

- Internet-based commercial venture, but not necessarily incorporated.
- Post-mortem written by one of the founders.
- Can be defined as a platform, connecting two or more groups.
- Established between 2004 and 2010 (i.e., Web 2.0, after the dotcom period)
- No more than 60 months old (i.e., early-stage startup).

The "Internet-based" criterion stems from the research purpose, which is to study online business, not offline-with-online-extension, or hybrids (i.e., "click-and-mortars"). A general definition of a platform was applied to identify appropriate startups; moreover, the process resulted in the emergence of four online platform types.

Additionally, the depth and length of stories were considered, so that the accepted stories had at least approximately 1,000 words to ensure some "thickness" (Neilsen & Rao 1987). On average, a post-mortem story

comprised 3,037 words. Post-mortems were preferred to be as candid and unbiased as possible, although this is a subjective measure; potential biases will be considered later. The stories were not anonymously written as they included authors' names. To maintain somewhat consistent interpretations, only stories written by founders were included; for example, there were some that recounted interviews with founders, but these were judged less authentic than had the founders actually written the stories. Tracking the authors in social media services ensured authenticity of the stories. Most founders were found via LinkedIn[16], and they provided more information on their cases.

According to the previously mentioned principles, non-Internet businesses, seemingly short and superficial stories, those not personally written by founders, and those written in an editorial style or by a journalist were filtered out. Filtering was conducted to limit the scope of study to self-reflection that was inherently honest, authentic, and of some depth. However, for selection, incorporation (i.e., being a registered company) was not required as it was perceived that this would rule out very early-stage startups on which the study focuses.

2.3.3 Description of the startups

Overall, after 12 stories were excluded based on the aforementioned criteria, 29 failure stories remained for analysis. Short descriptions were written to summarize the startups' purpose in an easily understandable way. Such descriptions facilitate the examination by third parties unfamiliar with the startups; crystallization is also helpful for analytical purposes. Descriptions were retrieved from two startup databases, CrunchBase[17] and ChubbyBrain[18], or, when neither of the databases contained data on a startup, Google search engine was employed to find a description, preferably from the founder's website or blog. The general descriptions can be found in the following table.

[16] www.linkedin.com
[17] www.crunchbase.com
[18] www.chubbybrain.com

Table 2 Descriptions of analyzed startups

Description	Type	Side A	Side B
Backfence was a hyper-local, community-based news and information service.	Content	Local users	Local users
Boompa was a social encyclopedia focusing on motor vehicles.	Content	Users	Advertisers
Bricabox was a platform for creating a personal social content site.	Social	Users	Users
ChubbyBrain captured and structured information on innovation economy and startups.	Content	Users	-
Contrastream was a social music platform.	Content	Indie musicians	Users
Devver aimed to turn desktop development tools into cloud-based services.	Infra	Users	Developers
Diffle was a social networking site centered on simple flash games.	Social	Users	Users
eCrowds combined Web content management and social networking for SMEs.	Infra	Consumers	SMEs
eHarmony for Hiring aimed to match job-seekers with job-providers.	Exchange	Job-seekers	Job-providers
EventVue was a tool for building conference communities.	Social	Conf. participants	Conf. participants
Imercive provided an IM marketing solution to help brands' consumer engagement.	Infra	Brands	Users
Kiko offered anyone a calendar to keep and share online.	Social	Users	Users
Lookery helped social networks distribute their data outside their Web sites.	Content	Users	Social networks
Meetro was a location-aware IM client and real-time social networking application.	Social	Users	Users
Monitor110 helped institutional investors access, analyze, and monetize Web information.	Content	Investors	-
NewsTilt was a service for journalists to build an online brand by engaging their readers.	Social	Readers	Journalists
Nouncer enabled real-time distribution of micro-content to Web applications.	Infra	Users	Developers
Overto aggregated information from different auction platforms to deliver better results.	Content	Buyers/sellers	-
Pixish was a platform for user-generated graphic design work.	Exchange	Designers	Design-seekers
PlayCafe was an online network that streamed user-generated game shows.	Content	Users	Users
[Q&A startup] aimed at creating a marketplace for selling and buying answers.	Content	Askers	Answerers
RiotVine was a social event guide for discovering and sharing events with friends.	Social	Visitors	Event organizers
SMSnoodle was an SMS based entertainment channel for the Singapore region.	Content	Content providers	Users
SubMate enabled discovering new people and things to do before and after commuting.	Social	Commuters	Commuters
Transmutable was a platform for doing 3D simulations on the Web.	Content	Users	-
Untitled Partners enabled fractional ownership of art through cooperative purchasing.	Exchange	Art-lovers	Art-lovers
Verifiable was a platform for data visualization.	Content	Users	Users
Wesabe was a finance service for tracking personal spending patterns.	Exchange	Consumers	N/A
Xmarks offers a social bookmarking and synchronization service.	Content	Users	Users

As can be seen, all platform types are presented. Their definitions are discussed in Subchapter 3.3. The frequency of platform types is as follows (N=29):

- 13 content platforms
- 8 social platforms
- 4 exchange platforms
- 4 infrastructure platforms.

Most platforms studied are two-sided, but there are also one-sided platforms, in which the users are not divided into two mutually complementing groups. The average lifetime of a startup was 26 months.

The oldest startup was 57 months at the time of failure, the youngest 8 months[19]. The sample comprised both B2C and B2B startups, with the majority being consumer-oriented startups. The mode of team size was 2.5 members, with the largest team having 30 members and the smallest one member. Most teams were male-dominant, and only two reported women in their team. Approximately half of the founders (57%) were first-time founders, the rest had earlier startup experience. All teams had technology experience, but only 38% reported prior marketing experience. The vast majority was US-based startups; there was one startup from Poland and one from Singapore. Almost all startups (86%) also applied either user-generation (UG) or aggregation as their content creation model[20], which makes UG (Chapter 3.4) highly characteristic of this sample. Other characteristics include offering free access/use of the platform, indirect monetization, and the freemium business model. These features become relevant in Chapter 4.

The contemporary focus (see Figure 4) excludes dotcoms, several of which were found among all retrieved post-mortems. Coincidentally, the selected startups are a part of the so-called Web 2.0 era (O'Reilly 2005). The Web 2.0 period can be seen to start from around 2005 when the concept was first introduced (O'Reilly 2005). The dotcom period is generally regarded to have occurred in the late 1990s to the early 2000s (Razi, Tarn, & Siddiqui 2004; Evans 2009a), including a strong hype cycle of unrealistic expectations for Web platforms and e-commerce (Lieberman 2005), and then a quick demise after a large share of these businesses failed to perform (Cochran et al. 2006).

[19] Calculated from date founded to the date post-mortem was published.
[20] A content model explains how the startup provides content for its users.

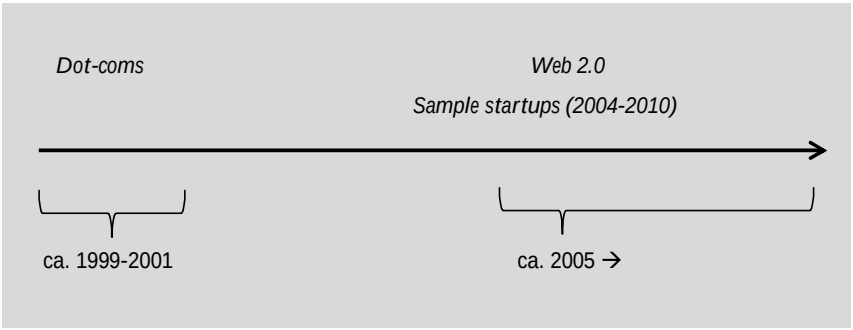

Figure 4 Historical positioning of the analyzed startups

The platforms in the dotcom era were mostly e-marketplaces (Wang, Zheng, Xu, Li, & Meng 2008); since then, there have been considerable changes in online startups' business models (Rappa 2013) . While the first wave of platforms included "importing" retail and B2B exchanges to the Internet, Web 2.0 platforms offer purely digital services on their own (Aggarwal & Yu 2012). This fact does not particularly reflect the research purpose (see Chapter 1), although it does add to the topicality and novelty of the material analyzed in this study.

With the relative "freshness" of the sample, the goal was to ensure that problems remain topical. If problems were already solved in the "latest batch" of Web startups, there would be no research gap in the empirical sense, which would be a critical problem for GT that aims at usefulness of the resulting theory (Glaser & Strauss 1967). Such a risk would be higher had the study included Web 1.0 startups, and ignored the implicit learning occurring after, and due to, them. In turn, the research gap in the literature stems from incomplete understanding on the chicken-and-egg problem, its solutions, and derivative problems (see Chapter 1.1).

2.4 Analytical approach

2.4.1 Coding process in GT

According to Strauss and Corbin (1994), after data collection, the researcher should start by *open coding*; for example, reading through narratives, making notes, and identifying themes and interesting phenomena. This process leads to the creation of categories, or groupings of concepts, that appear to relate to the same phenomenon (Glaser & Strauss 1967).

GT reaches theoretical refinement through iteration; once themes begin to emerge, the researcher re-reads the material while modifying conceptual codes. Essentially, this leads to an index of codes, organized under categories based on the nature of the phenomena being described in the text (Strauss & Corbin 1994). A category can contain subcategories if the researcher interprets the phenomenon as a hierarchy (Glaser & Strauss 1967).

Next, *axial coding* procedures are employed to compare extant codes to the subcategories, and a selected part of the material is modified to reflect the core category (i.e., selective coding). In general, axial coding refers to looking for relationships between conceptual constructs, and the conditions in which they take place; for example, they might coexist or appear only under specific circumstances (Strauss & Corbin 1994). The idea is to develop connections between the themes found in earlier coding (Strauss & Corbin 1994).

Through constant comparison, a grounded theorist derives the core category from the material (Glaser 2004). The method is then employed to build consistency through a mental process of comparing new coding to existing coding, so that it becomes part of a single theoretical framework (Goulding 2005). A suggested approach to this is *memoing* (Strauss & Corbin 1994; Glaser 2004), which means noting down ideas in a form of meta-data.

Constant comparison reveals whether the new data provide an *emergent fit* or not, thereby guiding theory generation (Glaser 2008). GT is an iterative process in which new themes and relationships emerge, and the researcher is required to re-code the data (Gasson 2003). Finch (2002) describes this as moving from description to analysis, and from analysis to explanation.

Grounded theory arises from the interaction between researcher and data; therefore, becoming intimate with the circumstances is helpful. According to Glaser (1978), understanding the context can increase *theoretical sensitivity*, which is a mixture of theoretical (i.e., the literature) and practical expertise, and can improve the researcher's judgment. Charmaz (1990) makes it clear that topical knowledge improves the researcher's ability to perform GT analysis. The researcher's inner ability to conceptualize in a meaningful way is highlighted by both Glaser (1978) and Strauss and Corbin (1994) through the concept of theoretical sensitivity.

Constant comparison is coupled with theoretical sampling by maximizing similarities and differences between coded phenomena to find the boundaries of theoretical constructs, not only what is apparent in a limited amount of data[21] (Creswell 2008). The end result should be an abstract theory derived from non-abstract data; that is, there is an increase in the level of abstraction (Strauss & Corbin 1994). Together, theoretical sampling (i.e., finding

[21] The requirement, therefore, is an adequate amount of data for all major variations to appear.

additional evidence to back up intermediary conclusions) and constant comparison direct the researcher to verify whether the emerging theoretical model holds as new data are collected, and to modify the model if necessary (Elliott & Lazenbatt 2005).

A critical part of GT, as in much research, is deciding what to include or exclude (Wagner et al. 2010). This cannot be known *a priori*, as central themes are unknown until open coding. Once they emerge, one resorts to *selective coding*; that is, discovering the central phenomenon (Glaser & Strauss 1967). The purpose of selective coding is to choose the themes and codes central to the theory under development (Corbin & Strauss 1990). The idea is that they are unknown *a priori*, as opposed to hypothetico-deductive logic, so that the researcher does not know before looking what is central in the data (Heath & Cowley 2004). Having strong presumptions, therefore, is a risk to finding the core phenomenon in the data[22]. Once the core phenomenon (i.e., category) emerges, alternative ways of looking at the material become less relevant, and the work pivots around the central phenomenon (Strauss & Corbin 1994).

2.4.2 Application of GT in this study

In this study, the author maintained an open mind when first becoming acquainted with the stories. The material was imported to QSR NVivo 10 (i.e., a software package for qualitative data analysis), with which it was coded. Figure 5 illustrates how GT was applied in this study.

[22] In this sense, GT formulation is an inductive process; however, empiricists and rationalists both agree that there is no pure deduction or induction because deduction by the researcher's human mind always carries some preconditions (i.e., no *tabula rasa*), as also does deriving conclusions from empirical data. For a treatment on this topic see, for example, Perry and Jensen (2001); for abduction, see the method section in Aarikka-Stenroos (2011).

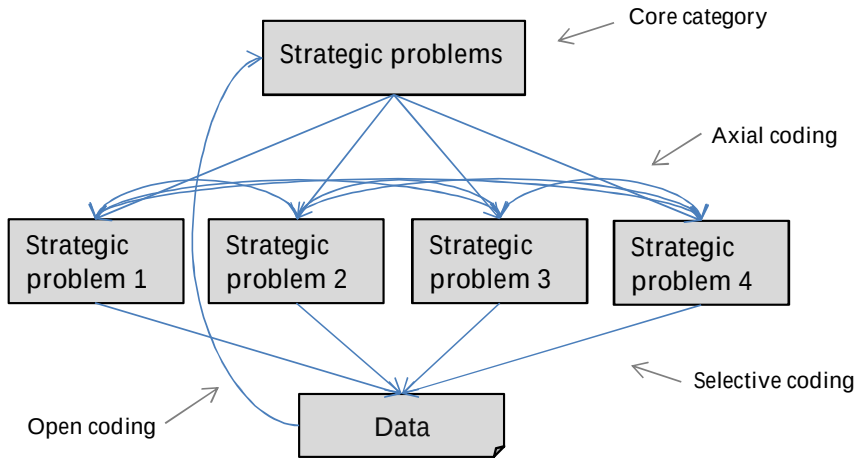

Figure 5 Application of grounded theory

First, open coding was employed for familiarization with the material. At this point, the process is exploratory and descriptive, and does not rely on hypotheses of earlier research, although there might be *theoretical sensitivity* arising from the literatures' knowledge, and professional and personal experience (Strauss & Corbin 1994). The process of constant comparison in this study involved 1) analyzing failure narratives to build grounded theory and 2) discussion with founders of other Internet startups outside the sample to verify the intermediary conclusions. Therefore, the results of inquiry are consistent with what founders deem important, but transcend individual accounts in comparison and level of abstraction (cf. Finch 2002).

After *open coding* (Strauss & Corbin 1994), there was the choice to focus on 1) startup failure, 2) strategic startup dilemmas, or 3) startup fallacies. Initially, startup failure was chosen as the focus because the author thought it was an interesting topic. However, reading the literature eventually made it clear that new venture failure has been quite extensively studied (see Chapter 1), with results similar to those suggested by the open coding. Therefore, the study risked confirming earlier findings and not generating much new knowledge. On realizing this, the researcher became familiar with the platform literature and decided to change focus. Therefore, "Dilemmas" was chosen as the core category and other phenomena were excluded from this work.

Generally, GT studies tend to choose one core category, due to reasons of manageability (Holton 2010). Dilemmas emerged as the core category in this study due to the prevailing role of strategic problems in founders' sense-making. In particular, as strategic problems emerged as the most explanatory theme, there was a shift from examining failure, as the core category, to strategic problems that were conceptualized as startup dilemmas. The kind of

flexibility this change represents can be regarded as an advantage of the GT method that encourages transformation in the course of analysis (Goulding 2005). It is better to change focus than to pursue a less fruitful topic (Corbin & Strauss 1990). Moreover, the earlier analysis is rarely wasted but re-emerges as insight for the new focus (Bauman 2010). For example, the initial focus on failure factors helped the author associate the strategic problems with failure; that is, ensure that they are important to the outcome.

In the axial coding phase, the researcher found both confirmation and exceptions, resulting in amending, extending, or refuting earlier assumptions; as well as developed connections between the categories. Throughout the research process, there was an iterative process of theory formation and constant comparison of new ideas to earlier ones. This process of familiarization, meant to increase theoretical sensitivity, included discussions with startup founders at various startup events in Finland (Turku; Helsinki), Sweden (Stockholm) and United States (San Francisco) between 2010 and 2014. The researcher participated in events where startup founders, investors, and enthusiasts gathered to present business ideas and demonstrations, and to network. The events included, among others, Good Morning Stockholm (2010; 2011); Slush Helsinki (2011; 2012); Summer of Startups keynotes (Turku, 2011); Startup Day (Stockholm, 2012); Launch Festival (San Francisco, 2014); and many other startup events in Turku and San Francisco[23].

The discussions, especially in the first years of conducting research, represent theoretical sampling in this study; that is, verification of intermediary conclusions. As the study evolved into strategic dilemmas, the researcher began asking questions such as "What is your startup's biggest problem at the moment?" Answers categorically corresponded to one of the identified dilemmas, most typically relating to user acquisition. This led to belief that adequate theoretical saturation had been accomplished. Overall, dialogue with founders was comfortable as it is conventional to pitch (i.e., present business ideas) at the events in which the author participated; thus, founders were in a ready state of mind to discuss their startups. In addition, many of the founders were interested when the author mentioned he was studying the failure of platform startups, and they could relate to the dilemmas as explained by the author.

Moreover, the author was involved as an active member and board member of the Boost Turku Entrepreneurship Society based in Turku (Finland) during the period of data collection and analysis, and could therefore observe several early-stage online startups in their infancy.

Overall, discussions with startup founders and also reading relevant background material increased the researcher's domain-specific knowledge on

[23] The author spent three weeks in San Francisco participating in local startup events.

online startups, thus facilitating the conceptualization of dilemmas. The participation in startup events provided useful access to founders with different business ideas, and enabled comparison with the emerging categories based on the startups in the sample.

2.4.3 Coding guide

Strauss and Corbin (1994) set out an exact procedure, a *paradigm model*, for GT analysis. In this study, the paradigm model requiring the analysis of conditions, context, action, and consequences (Strauss & Corbin 1994) is regarded as overly complex and not relevant to the research topic. Partington (2000, 95) notes that this is a common concern and discourages the literal use of the Straussian approach:

> *"The difficulty of applying universal grounded theory prescriptions is borne out by experience with doctoral students working in the field of organization and management who have attempted to follow the Strauss and Corbin approach but have abandoned it because of its bewildering complexity."*

Glaser (1992) strongly attacks the Straussian approach for what he terms "forcing conceptual categories". This disagreement has been discussed extensively elsewhere (e.g., Heath & Cowley 2004; Locke 1996), and will not be repeated here. Instead of employing Strauss and Corbin's (1994) paradigm model, a *coding guide* is generated based on subcategories of the core category; namely, "Dilemmas" as the core category with each dilemma as a subcategory. Based on this classification, the material was re-coded. Table 3 shows examples from the coding guide.

Table 3 Examples from coding guide

Code	Meaning	Example
Cold start dilemma	Inability to get content without users.	*[I] underestimated the "Cold Start" problem, I read this article by Bokado Social Design which talks about a big issue you face with a social site, especially when it relies on user-generated content. The value you provide to your users centers around the content on the site, so to build a user-base you need a lot of content created by the first users to kick-off the community.*
Lonely user dilemma	Inability to get users without other users.	*If someone wasn't online when you were online, they were no good to you. While the real-time chat aspect of the application made for some really serendipitous meetings, it also made it harder for people to gauge the activity of their communities, especially if they logged in at odd hours, people were set as away, etc.*
Monetization dilemma	Inability to charge money and get users.	*For four years we have offered the synchronization service for no charge, predicated on the hypothesis that a business model would emerge to support the free service. With that investment thesis thwarted, there is no way to pay expenses, primarily salary and hosting costs. Without the resources to keep the service going, we must shut it down.*

The comprehensive coding guide can be found in Appendix 1. In total, 162 codes were utilized to discover meanings from the data. At the open coding phase, general reasons for failure were coded. In the axial coding phase, they were grouped into larger categories such as "Marketing", "Team", and "Business model". These described the founders' reasons for failure. However, two theoretically interesting categories also emerged at this stage: "Dilemmas" and "Fallacies", respectively referring to strategic problems and erratic thinking. This is in line with GT, whereby coding proceeds from description to abstraction from time, place, and people (Glaser 2008).

The author was unable to find the approach of *coding guide* in the GT methodology literature; the closest is Schmidt's (2004) description of employing a coding guide in the analysis of semi-structured interviews. Nevertheless, this approach was useful[24]. Additionally, the online platform typology and ideal UG model (see Chapter 3) reflect the conditional parameters that axial coding, and also its paradigm model and conditional matrix, aim to discover from the data. In other words, the spirit of GT is followed. At the same time, this feature of opting towards more flexibility positions this work more closely to classic GT, according to the prevailing interpretations of these two schools (e.g., Heath & Cowley 2004; Locke 1996). Therefore, this study can be perceived as being closer to the Glaserian school, advocating creativity instead of rigor of analysis, although it does not explicitly subscribe to either school. In fact, the commonalities of the two approaches seem to exceed their differences

[24] It can be argued that writing a coding guide taps into the same cognitive processes as *memoing*; namely, articulating and explicating the nature of the emerging constructs.

and, as shown by later editions of Strauss and Corbin's book first released in 1994, they do not necessarily require the categorical following of their procedure[25]. Therefore, it is not seen that two approaches are mutually exclusive and, consequently, there is no need for a strict adherence to either at the expense of the other.

Finally, in the course of the analysis, the author applied game-theoretic illustrations (i.e., strategic game situations) as an analytical tool. Regarding dilemmas as "games" facilitated their systematic analysis. These illustrations can be seen in Chapter 4.

2.5 Literature approach

This chapter describes the process of the literature review. Note that the literature searches were conducted only after the initial analysis (see Chapter 2.2). In other words, the analysis guided the selection of this particular theoretical framework, and therefore positioning towards the literature. The overall work is positioned to the platform literature, which can be perceived as a multi-disciplinary field. This enabled the researcher to selectively "borrow" the literature from other areas, such as entrepreneurship and strategic management; that is, beyond the contribution of these disciplines to the platform literature. However, this study is positioned in the platform literature, from which theoretical constructs are drawn.

The base concepts were as follows:

- Online platforms and 'internet platforms'
- Platforms
- Two-sided markets and 'two-sided platforms'
- Double-sided markets
- Dual-sided markets
- Multi-sided markets and 'multisided markets'
- Multi-sided platforms and 'multisided platforms'.

The concepts were deduced from the platform literature. Table 4 contains keywords that were combined with the base concepts to produce search queries.

[25] "The analytic process should be relaxed, flexible, and driven by insight gained through interaction with data rather than being overly structured and based only on procedures" (Corbin & Strauss, 2008, p. 12).

Table 4 The literature keywords

Related dilemma	Keywords
Cold start dilemma	chicken and egg, chicken-and-egg, chicken-egg user generation, user-generated content
Lonely user dilemma	network effects, critical mass
Monetization dilemma	monetization, monetization freemium
Remora's curse	power, embedded

Freemium, a term originated by venture capitalist Fred Wilson in 2006 was selected as a keyword because it has gained increasing interest from practitioners and academicians (see e.g., Teece 2010, 2011), and many online startups have adopted it as their monetization model. For the same purpose, 'user generation' was included. There were not many studies that referred to these concepts in the platform context; however, studies conducted on other contexts were chosen, which proved useful in positioning the dilemmas (see Chapter 4). The literature searches were conducted with the Nelli search engine (i.e., Turku University's library system) that connects with the major literature databases including, for example, Science Direct, EBSCO, and Web of Science. A special approach was employed to generate search queries, which involved determining base concepts and combining them with keywords relating to selected dilemmas. For example, if a base concept was 'online platforms' and the dilemma-specific keyword was 'power', then the search query would be 'online platforms + power'. Phrase match of search words (e.g., "keyword") was utilized, which resulted in more relevant hits than broad match (i.e., keyword). All fields of articles were searched, including author-specified keywords, title, and abstract.

The results were checked for relevance by reading their abstracts to eliminate irrelevant articles (for a similar approach, see e.g., Wiltbank, Dew, Read, & Sarasvathy 2006), leaving 302 articles that were saved to folders and read in the process of analysis. The literature was then expanded based on reading the articles, a form of snowball sampling. In particular, *Publish or Perish* software was employed to retrieve articles[26]. This freeware software for Windows enables the user to run queries on *Google Scholar*, and shows up to 1,000 results in one view. Additionally, it enables rapid sorting based on rating (i.e., number of citations). According to Kousha and Thelwall (2007), Google Scholar is a

[26] http://www.harzing.com/pop.htm

useful complement in retrieving research material, as it can find scholarly works not included in academic databases.

Priority in selecting articles for a thorough reading was given to recent research as interest in platforms is relatively new. Moreover, classic articles were read to discover the origins of concepts and theory; for example, the standards literature from the 1980s (e.g., Katz & Shapiro 1985; Farrell & Saloner 1985), and network effects from Rohlfs (1974). The classics, and also more recent seminal papers such as Rochet & Tirole's (2003), were deduced from the recent literature. The aim was to utilize the state-of-the-art platform literature when positioning the dilemmas. Moreover, dissertations were considered, as some eminent platform theorists wrote their dissertations on platforms (e.g., Hagiu 2008). Working papers were also included, although they were retrieved beyond the database search.

According to Roson (2005), working papers form a considerable part of the early (modern[27]) platform literature. Additionally, it was found that the highest fit for this study were articles explicitly mentioning 'online', 'internet', or 'platforms' in their titles. Departing further from these concepts meant abstracting from the context of online platforms and moving into more general studies on the phenomenon. Merely including the theme keywords would have generated a vast amount of the literature relating to the respective phenomenon (e.g., 'power'); however, the scope was kept within the platform literature. Glaser (2004, 12) explicitly mentions that GT treats the literature "*as another source of data to be integrated into the constant comparative analysis process*." Arguably, this has led to the selection of a theoretical framework compatible with the emerged phenomenon.

[27] "Early modern" refers to the interest following Rochet and Tirole's seminal working paper in 2001, later published in 2003.

3 THEORETICAL BACKGROUND

3.1 Concept of platform

3.1.1 Platform theory and platform literature

Instead of a unified *platform theory*, scholars rely on similar constructs and assumptions to study the particularities of platform business. The literature focusing on the issues of two-sidedness, the chicken-and-egg problem (see Chapter 4.4), critical mass, network effects, multihoming, and single-homing (see Chapter 4.7), and associated constructs comprise what can be termed the *platform literature* (Rochet & Tirole 2005; Roson 2005; Birke 2008; Shy 2011). These constructs also form the theoretical foundation of this study.

Platforms have been studied in several contexts. The following list contains examples of some platforms that have been studied: online infomediaries (Hagiu & Jullien 2011), mobile application marketplaces (e.g., Salminen & Teixeira 2013), operating systems (Church & Gandal 1992), videogames (Maruyama & Ohkita 2011), Yellow Pages (Rysman 2004), credit cards (Rysman 2007), magazines (Kaiser & Wright 2006), and computer industry (Gawer & Henderson 2007). More examples can be found, for example, in work by Parker and Van Alstyne (2005). The different contexts are joined by similar dynamics, including two-sided economics and network effects, which are crucial for understanding the platform model. These dynamics are discussed in the following subchapter.

3.1.2 Defining platforms

A platform, or a two-sided market, can be defined in many ways. Table 5 shows definitions judged as the most important based on the literature review.

Table 5 Definitions of a platform (i.e., two- or multisided market)

Author(s)	Definition
Evans (2003)	*"[multi-sided] platforms coordinate the demand of distinct groups of customers who need each other in some way."*
Jullien (2005)	*"[Two-sided markets are] situations where one or several competing 'platforms' provide services that are used by two types of trading partners to interact and operate an exchange."*
Rochet and Tirole (2005)	*"markets in which one or several platforms enable interactions between end-users, and try to get the two (or multiple) sides 'on board' by appropriately charging each side […] while attempting to make, or at least not lose, money overall."*
Armstrong (2006)	*"Many markets involve two groups of agents who interact via 'platforms,' where one group's benefit from joining a platform depends on the size of the other group that joins the platform."*
Evans (2009b)	*"[Platforms] serve distinct groups of customers who need each other in some way, and the core business of the two-sided platform is to provide a common (real or virtual) meeting place and to facilitate interactions between members of the two distinct customer groups."*
Gawer (2009)	*"Industry platforms are building blocks […] that act as a foundation upon which an array of firms (sometimes called a business ecosystem) can develop complementary products, technologies or services."*
Rysman (2009)	*"Broadly speaking, a two-sided market is one in which 1) two sets of agents interact through an intermediary or platform, and 2) the decisions of each set of agents affects the outcomes of the other set of agents, typically through an externality."*
Hagiu and Wright (2011)	*"an organization that creates value primarily by enabling direct interactions between two (or more) distinct types of affiliated customers"*

First, based on the definitions, some platforms can be described as *infrastructure*[28] rather than a market. Markets are what economists consider places of exchange; that is, where people and companies trade goods and services (for more definitions, see Diaz Ruiz 2012). Exchange, in other words, is one form of interaction taking place in a platform of a particular kind (i.e., a marketplace), but it is not the only form, as will be shown in this study.

Second, a platform can take the shape of a network; consider, for example, a telephone network or a social network on the Internet. However, it can also be depicted as a repository of content, from which users retrieve content that others have contributed. In sum, there are a large number of platforms with various traits, although they share the same core (i.e., *place of interaction*[29]).

Third, as can be seen from Table 5, a characteristic commonly associated with platforms is the presence of so-called network effects (Katz & Shapiro 1985). In a simple form, due to network effects, the more users a platform has,

[28] *"[A] base of common components around which a company might build a series of related products*" (Cusumano 2010).

[29] Moreover, a place indicates a physical or virtual location.

the more valuable it becomes. When the platform is subject to direct network effects[30], a user's benefit from utilizing a product increases with the number of other users of the same kind (Shapiro & Varian 1998). Some physical networks, such as railroads or telephone networks, are classic examples of direct network effects (e.g., Katz and Shapiro 1985). For example, as the railroad network grows, more destinations become available to passengers. In a similar vein, the more there are installed telephone connections, the more people one is able to call. The required network size; that is, an adequate number of users for a platform to serve its purpose of providing matches, is termed *critical mass*.

In addition to direct network effects (i.e., relating to users of the same kind), a platform can be subject to *indirect* network effects (i.e., relating to users of another kind), which are essential for two-sidedness in the platform definitions; that is, there are two distinct groups which influence each other (Rochet & Tirole 2003). Moreover, an indirect network effect can be positive or negative, which is strictly a question of perception. Table 6 is based on Shy (2011) who distinguishes between positive and negative, and direct and indirect dimensions.

Table 6 Types of network effects

	Direct	**Indirect**
Positive	Positive direct network effects (e.g., telephone)	Positive indirect network effects (e.g., auction)
Negative	Negative direct network effects (e.g., spam)	Negative indirect network effects (e.g., advertisements)

Note that, due to *perception*, some network effects can be interpreted as both positive and negative by different people (Shy 2011). For example, some users might enjoy advertisements, whereas others find them disturbing[31]. Finally, indirect network effects can be asymmetric, so that one side of an interaction appreciates the presence of the other side more than that side appreciates it. For example, if there are only a few buyers in a marketplace, new buyers are more important to sellers than *vice versa*. However, sellers are important for buyers, as there would be no marketplace without them.

[30] Another term, *network externalities*, is sometimes employed to refer to the same phenomenon. In this study, they are regarded as interchangeable. This is in line with common terminology in the literature, while *bandwagon effects* is also employed. However, strictly speaking, "*any economic effect is an externality only if not internalized*" (Farrell & Klemperer 2007, 2021).

[31] The perception of advertising is affected by several factors, such as targeting and quality. Thus, it is a good example of the relative nature of network effects.

More precisely, two-sided platforms "*coordinate the demands of distinct groups of customers who are dependent on each other*" (Hagiu 2006). Jullien (2005, 234) defines two-sided markets as "*situations where one or several competing 'platforms' provide services that are used by two types of trading partners to interact and operate an exchange*." Consistent with these definitions, Evans (2003) associates three properties with two-sided platforms: 1) the presence of two distinct groups; 2) demand coordination benefits, whereby one group increases the benefits perceived by the second group; and 3) the necessity for an intermediary to "internalize the externalities". According to Evans (2002), it is crucial in two-sided markets to differentiate between price structures[32] and price levels[33].

The demand coordination benefits in this definition can be regarded as equivalent to the concept of network effects[34]. Following Rochet and Tirole (2003), it can be regarded as typical for platforms to subsidize one group of users while making profit from the other group. However, because the two groups experience cross-group linkages, it is not possible to isolate the profits from the second group without the presence of the first group.

3.1.3 Markets vs. platforms

Hagiu and Wright (2011) state that the platform literature "*has constantly struggled […] with a lack of agreement on a proper definition*", continuing to state that some authors have implied that retailers, such as grocers, supermarkets and department stores would be platforms. Indeed, the basic tenets[35] of 'two-sidedness' and 'interaction between them' can be satisfied with any market, and therefore the platform literature would be no different from the earlier way of understanding markets.

Relating to this conflict, Rochet & Tirole (2005, 2) refine their original 2003 definition because, based on it, "*pretty much any market would be two-sided, since buyers and sellers need to be brought together for markets to exist and gains from trade to be realized*." For example, consider a hardware store that deals with both suppliers and end customers; end customers go there because the store provides hardware which, in turn, is provided because the store

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32 "*How to divide the total price [of a transaction] between buyers and sellers*" (Evans 2002, 46).

33 "*What total price to charge [from] buyers and sellers*" (Evans 2002, 46).

34 The concept of network effects differs from economies of scale in that the latter is regarded as a feature of a single firm, whereas network effects generate benefits for the whole network of firms, which are compatible with one another (Birke 2008). However, network effects can, in a sense, be understood as demand- or supply-side economies of scale.

35 Two-sided platforms "serve two types of agents, such that the participation of at least one group raises the value of participating for the other group" (Li, Liu, & Bandyopadhyay 2010).

is frequented by end customers. This and any type of mediated market exchange effectively follows the logic of network effects, and will be an "ordinary" market. This definition is also visible in Evans (2009b, 4), who argues that the fundamental role of platforms is "*to enable parties to realize gains from trade or other interactions by reducing the transactions' costs of finding each other and interacting.*" In general, such a role can be regarded as being close to that of a marketplace mediating supply and demand.

How, then, are platforms different from any other market? The platform literature provides an answer. In their later paper, Rochet and Tirole (2005, 2) redefine a two-sided market as "*one in which the volume of transactions between end-users depends on the structure and not only on the overall level of the fees charged by the platform*". Such a particularity does not exist in a one-sided market. In other words, this definition implies that the price structure replaces price level as the key focus of interest. For example, one cannot consider how free users are charged in freemium-based[36] online platforms (i.e., one side), but has to include paid users (i.e., two sides) to understand the market. As there are expected network effects between the two groups, influencing how price is distributed between them will either increase or decrease the number of interactions.

This definition also avoids some of the other shortcomings. First, it refers to *users* as opposed to trading partners, which is more appropriate for some non-exchange platforms. In other words, the scope and type of interaction in platforms exceeds the notion of exchange; it can be exchange, but it can also be something else while still having indirect economic implications. By strict definition, when the type of interaction moves from economic exchange to other forms, the platform is no longer a marketplace. For example, it is not fair to argue that a social network would be a marketplace, because users most often interact out of non-economic motives.

Are, therefore, all markets platforms? Essentially, "Yes". As they require both buyers and sellers to be present, they are two-sided platforms or two-sided marketplaces. However, not all platforms are marketplaces. A marketplace is defined by exchange while, for example, a content platform host activities relating to the content without engaging in exchange with other users. However, although all platforms do not require economic exchange, they require some form of interaction. It might be discussion, sharing, content production, and consumption, or more; thus, not all platforms are marketplaces.

[36] Freemium, a portmanteau of 'free' and 'premium' (Wilson 2006), refers to one group of users paying for a Web service and another utilizing it for free.

3.1.4 Mediation vs. coordination

Rochet and Tirole's (2003) price coordination, however, is not foolproof as their definition does not solve the problem of mediation; that is, how is interaction, such as exchange, organized in a platform. For example, consider a merchant who subsidies some suppliers to sell products cheaper to end users; here, price structure is affected and also the volume of products is likely to change as consumers buy more due to low prices.

A satisfactory solution to this issue is offered by Hagiu and Wright (2011) who distinguish resellers, or classic intermediation, from platforms, so that the former deals with each market side separately; for example, a hardware store first negotiates the inventory with suppliers, and then sells it to customers via its retail locations. Essentially, the platform owner is an enabler of interaction, but its active participation is not required for the participants to self-organize interaction, as participants are engaged in direct communication. The situation of *intermediation versus coordination* is illustrated in the following figure.

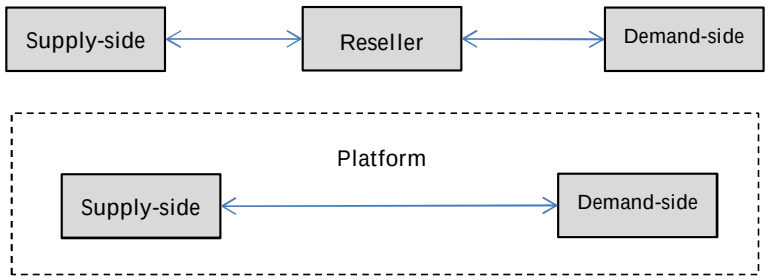

Figure 6 Difference between a reseller and a platform

In both cases, the presence of the other side is beneficial (i.e., there are network effects); however, the coordination structure is different. In regular intermediation, the intermediary first creates dyadic relationships with both parties individually, and only then enables the transaction. In a platform, the intermediary provides the platform for "open" interaction between the parties. This has strong implications; for example, relating to customer power (i.e., *who holds the customer relationship?*) and the quality of interaction. As such, consider how the platform owner is able to filter out negative externalities (this topic is revisited in Subchapter 4.5.2.).

Regardless of it being in direct control of the interaction, the platform still has to attract both participating sides (see Chapter 4.4), and enable their interaction through some medium; for example, a website, bar, or a shopping mall. Often, it also has to monitor the quality of interaction to prevent negative

externalities[37]. The argument presented in Figure 6 is compatible with Piezunka (2011) who differentiates between *intermediation* and *coordination* as two distinct platform activities. Rysman (2009) follows a similar logic, noting that in the intermediary model, which he terms a one-sided market, the reseller takes ownership of the goods, whereas in a two-sided market the platform owner enables transactions between exchange partners.

This distinctive feature has also been noted by other scholars (e.g., Luchetta 2012). Essentially, mediation by the platform is not necessarily of a transactional nature, and the parties interact directly with one another. For example, users send messages to one another, and the platform merely enables this direct interaction. According to this perspective, shopping malls are platforms because they enable direct interaction between shopkeepers and shoppers; supermarkets are not, because they are reselling the suppliers' products. The implication is that a shopping mall enables a direct relationship with the customer, whereas supermarkets take control of customer relationships; such implications are discussed in Chapter 4.7.

Moreover, platform coordination has some distinctive features. The evolution from market coordination to intermediation and, finally, to platforms can be understood with the help of the following figure.

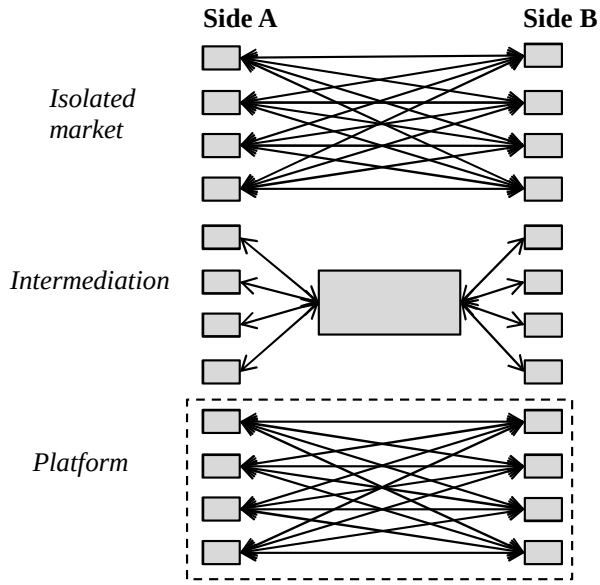

Figure 7 Market coordination and platforms

[37] The exception is when the groups are self-coordinating, which follows the ideal UG model.

1. In the beginning, there are many isolated marketplaces where interaction between market actors takes place (i.e., *isolated marketplaces phase*).

2. Then, there is a mediator that cuts the transaction costs relating to search, negotiation, and interaction between market actors (i.e., *mediated marketplaces phase*).

3. Finally, there is a *unified platform* where, again, parties self-coordinate; however, here, the platform technology provides them with tools to cut transaction costs. The unified platform is independent of time and place, unlike isolated marketplaces.

In this evolutionary perspective, the match-making model moves from disintermediation to mediation to platform. In the first, matches are random and *ad hoc*, whereas in a platform they are controlled by the platform technology. Between these two, the intermediary cuts the number of connections required from a market actor to successfully transact with another actor; these are classic intermediation benefits widely known in the strategic management and marketing literature[38] (see e.g., Bergern Dutta, & Walker 1992; Bakos 1998). In brief, the platform model enables scaling of market coordination without losing the intermediation benefits, as self-organization is highly efficient through the platform technology.

3.1.5 Direct and indirect effects of interaction

Luchetta (2012) employs the aforementioned distinction to divide platforms into two-sided transaction and two-sided non-transaction markets. Indeed, the distinction makes intuitive sense because a transaction does not always include only the two sides; for example, in media markets where buyers of the media space (advertisers) transact with both the advertising network and the consumers seeing the ads. However, Luchetta (2012, 11) then claims that

> *"In media markets, the two sides are not necessary, they represent a business strategy. Television channels are a good example: there are channels whose business model is two-sided, that is based on free content and advertising revenues, alongside of pay-per-view channels which earn revenues from subscription fees."*

[38] If there are x supply agents and y demand agents in an isolated market, the number of potential connections in an isolated market is $x*y$. In the intermediation model, they only need to deal with one. The intermediation benefit is then $(x*y)$-1 for the whole market, and x-1 or y-1 for the agents, respectively. The number of potential connections is the same in a platform as in isolated markets, but it is assumed there exists a factor k, according to which both the overall efficiency and efficiency of an agent to find matches is better than in the isolated market model.

However, this study disagrees with the argument, simply because of network effects; that is, benefits derived by advertisers from displaying ads to users. The advertising-based platform would not exist without advertising and therefore, even assuming no direct interaction between advertisers and users[39], users derive indirect benefit from the existence of advertisers in the platform. Moreover, it is not essential to delimit the type of interaction to transacting. In an online media, interaction between advertisers and users takes place, for example, through impressions (i.e., views), clicks, and email subscriptions. Eventually, users might purchase; however, before that, the advertiser is interested in conversion-supporting actions in the sales process, as is generally understood in online marketing theory (Soonsawad 2013). Two sides are therefore necessary from the advertiser's perspective.

However, if we think thoroughly, they are also necessary from the user's perspective. Namely, users benefit indirectly from the advertisers' presence, even if they might have direct negative "mind harm" from advertising. By delimiting 'interaction' to only taking place between users and content providers, one misses the further layer of interaction between advertisers and content providers. The logic is depicted in the following figure.

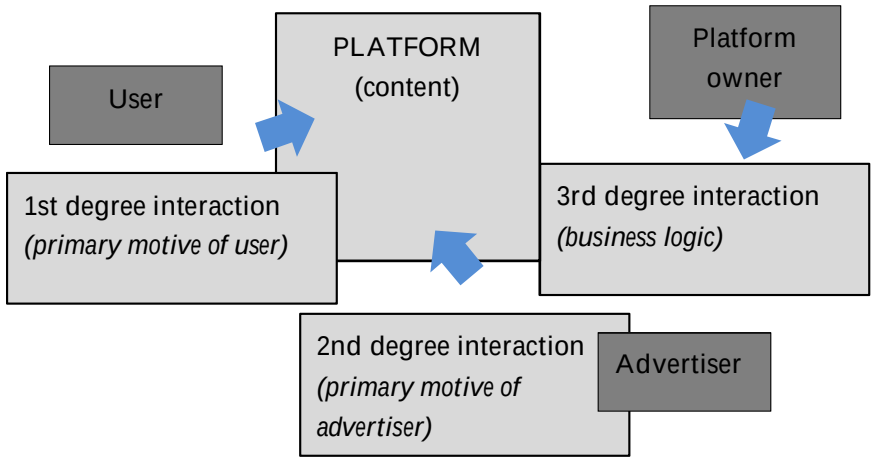

Figure 8 Interactions in an advertising-based online platform

[39] This is not categorically the case; consider a user clicking an ad on the website, which is a direct form of interaction. Further, the goal of advertising is to derive deferred interaction benefits "down the road"; for example, when a user is next changing a car and recalls the banner ad.

Direct interaction is when advertising is shown to the user[40]. A third degree of interaction is that which takes place between the advertiser and platform owner[41], termed *business logic*. In sum, advertising-based platforms can, according to our reasoning, be termed platforms. However, the remark by Luchetta (2012) is useful in that it recognizes the difference between a market, as an entity, and a platform as a goal-driven firm. Other notable key distinctions are that the platform interaction is not always exchange but that its goal can be non-economic gains and that, in a platform triad, the user simultaneously might indirectly enjoy the advertiser's presence, for enabling free content, and directly dislike advertising. This clearly fortifies the rule of *no free lunch* and tends to be generally accepted by users (cf. Pauwels & Weiss 2008).

Therefore, the separating factor can be seen in the *direct connection* between users from different sides. In the hardware example, the suppliers have already delivered products prior to a visit; it would be a platform if users could see the inventory in advance and order directly from the suppliers. Ordering from the retailer, as opposed to ordering directly from the supplier via a website, does not constitute a platform but a reseller[42]. Second, the platform differs from a standard market with intermediaries, in that a standard market advocates 'one-to-many' structures (see e.g., Dwyer, Schurr, & Oh 1987), whereby the market-maker is transacting with suppliers and end users separately at different touch points.

In contrast, in a platform, the parties interact with each other at one touch point; that is, not with the platform but still *via the platform*, which is a distinction from dyadic transactions. In platforms, the major task for the platform owner is to build liquidity; referring to the number of interactions, sometimes this might involve creating a critical mass of participants on both sides (Evans 2009a).

This solves the conceptual problem as in the hardware example, buyers and sellers would not be in direct interaction with one another and, therefore, the market would not be a platform. The argument is consistent with Hagiu and Wright's (2011, 2) definition: "*[Multisided platforms] enable direct interactions between the multiple customer types which are affiliated to them.*" As such, platforms are not intermediaries in the traditional sense; rather, they are places of interaction, offering facilitating service or features to their users.

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[40] However, consider the limitations; for example, *banner blindness* (Benway & Lane 1999) makes users effectively ignore advertising, in which case the desired interaction benefit does not materialize. This works both ways; as noted by Evans (2002), the platform is unable to tax transactions beyond the platform (i.e., the value capture problem), no matter how large the deals made by users and advertisers.

[41] Note that 'platform owner' is employed interchangeably with 'platform sponsor' in this study.

[42] In this type of interaction, the intermediary is directly interfering in transactions between users in a way other than offering the medium.

3.1.6 Networks vs. platforms

How do platforms differ from networks? Structurally, a platform can be understood as a set of interlinked nodes (e.g., Westland 2010). It is only when we segment the network users into various groups when the two-sided or multisided dynamics of platforms become relevant. For example, a one-sided platform is the same as any network in terms of network effects: the more there is any type of users, the more new users are willing to join. The same does not apply in two- or multisided platforms in which the extant users need to be of a complementing (i.e., different) type to encourage joining (i.e., positive indirect network effects). For example, if there are many sellers in a platform but few buyers, adding more sellers does not increase other seller's willingness to join; in fact, it might be reduced by such an increase (i.e., negative direct network effect). Therefore, while platforms, like almost any social construct, can be modeled and understood as a network, there are particular dynamics for which perceiving platform startups as platform startups and not network startups is meaningful. The analysis is likely to become more useful as a consequence of such a decision.

3.1.7 Websites vs. platforms

Another defining question is: *what differentiates a platform from a regular website?* Following the earlier argumentation, in a normal website, a visitor does not interact with other visitors. If this is so, then the website *is* a platform. In practice, the interaction has a purpose, such as engaging with content-related activities, social interaction, or exchange. As the reader might remember, this also clarifies why a shopping mall is a platform but a department store is not. It also marks why research is needed; the nature of interaction taking place in platforms is believed to be different to that in an intermediary setting.

For example, consider two firms: *ActivityGifts*[43] and *Gidsy*[44]. Both ecommerce sites sell experiences[45]. In both cases, the end "product" is sold by the startup and provided by a supplier; however, who coordinates the exchange is crucially different. In Gidsy, the buyer contacts the service provider directly, and the website is merely a platform where anyone (i.e., users) can join and place experiences for sale. In contrast, ActivityGifts first contracts individual suppliers and then resells their services on the website, taking care of the

[43] www.activitygifts.com
[44] www.gidsy.com
[45] E.g., a tandem jump in Prague.

customer interface (i.e., an intermediary model). This has considerable implications for the two firms; for example, ActivityGifts' model is much more difficult to scale up than Gidsy's model because it requires adding additional sales personnel to contract suppliers, and customer service personnel to manage the customer relationships and support, whereas Gidsy's model might require more trust from buyers, as suppliers are not verified, and leave the platform owner vulnerable to direct transacting between buyers and sellers outside the platform (i.e., the *value capture problem*). In sum, ActivityGifts is a reseller (i.e., a place of buying) and Gidsy is a platform (i.e., a place for interaction that is, in this, case buying)[46]. A website, whether providing products or not, must enable direct interaction between actors to be definable as a platform.

3.2 Platform definition of this study

A few notions arise from the previous definitions that influence how platforms are defined in this work. First, "trading partner" (Jullien 2005) is a narrow conceptualization of the activity taking place in some platforms, especially at the consumer side. If the basic unit is interaction[47] as opposed to exchange, it is possible to examine two-sided interactions between users of the same or different kind, users and platform, and users and advertisers. Instead of trading partners, therefore, this study mostly refers to 'users' as actors in online platforms. However, user is not a synonym for customer, and therefore the definition *two groups of customers* is different from our purpose; in practice, either of the groups might be treated differently based on their ability or willingness to pay (WTP).

Second, there is a problem with perceiving the growth of indirect network effects as the growth of the number of actors in the complementing part. This feature is inherited from the early network effects literature focusing on industry standards (Katz & Shapiro 1985), whereby the number of participants is restricted, and from network theories such as Metcalfe's law[48], which focus on the growth of an infrastructure such as the Ethernet or telephone networks. The fallibility of *size equals critical mass* will be discussed in Subchapter 4.5.2.

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[46] However, both have the same revenue model: they make sales and retain a commission prior to forwarding payments to suppliers.

[47] Any type of activity necessitating two or more people to take place. Note that 'interaction', in a similar sense, is also employed by Rochet and Tirole (2005).

[48] The value of a network increases proportionally to n^2, when n is the number of individual interconnected nodes.

Based on the previous discussion, platforms in this study are defined as follows:

> *A platform is a place of interaction among one or many groups of users whose interaction benefits, known as network effects, the platform owner aims to increase and monetize.*

The 'place' attribute is similar to Evans' (2009b) definition of platforms as physical or virtual *meeting places* for two distinct groups. The place can be a marketplace, in which case the interaction is in a form of exchange between buyers and sellers, or it can be a content platform in which users create content such as discussions or video. Furthermore, it can be a social network where users engage in social interaction. What makes Internet platforms interesting, from both practical and theoretical perspectives, is their immense potential for scaling (*as in*: increase in size). For example, Facebook grew from zero to one billion users in eight years (Shaughnessy 2012). Clearly, this potential opens new types of business opportunity. Startups are among the first to experiment with these opportunities in platform markets. Their role is either to create new platforms or join existing ones as a complement; both strategies are considered in this study.

Monetization in this definition is similar to "internalizing externalities" (Evans 2002; Rochet & Tirole 2003), in that the platform extracts rents for the coordination benefits it provides for its members. As noted, delimiting the 'two groups' required for platforms to buyers and sellers (e.g., Li et al. 2010) is not appropriate in the online context because other divisions are equally relevant, such as, for example, free users and paid users, users and advertisers, and contributors and consumers of content. Buyers and sellers are associated with exchange platforms in this study, and other groups under their proprietary platforms. Therefore, the scope of platforms extends beyond markets, and the definition by Hagiu and Wright (2011) is the most influential for the definition of a platform in this study. Note, however, that this does not render the two-sided *market* literature obsolete; most of it applies even when the interaction in the market is other than economic exchange.

Critical to this notion, in the context of online platforms, is that match-making is performed through programmatic means; that is by algorithms matching complementing parties (e.g., buyers and sellers; men and women) based on the criteria and other information they have willingly given, or information that is retrieved from their behavior or other context to facilitate match-making. These actions of the platform owner aim to increase the number of matches and subsequent interaction; outcomes that are associated with the viability of the platform, both in terms of liquidity and monetary gains.

3.3 Typology for online platforms

This section presents the types of platform examined in this study, and relates them to other platform types studied in the literature. Classification of platform types can be employed to understand their strategic problems. In particular, different *complements* and *motives of participation* are associated with different platforms. Because complements are associated with the strength of network effects (Parker & Van Alstyne 2010), and motives with the use of a platform (Boudreau & Lakhani 2012), recognizing that these vary by the type of platform might lead to important discoveries for their strategic management.

Platform classifications relevant to this study can be divided into a hierarchy of three domains:

General platforms → Technology-enabled platforms → Online platforms

These domains are now explored in more detail. First, Evans (2003) identifies three types of platform: 1) market makers, 2) audience makers, and 3) demand coordinators. Market makers create an environment for economic exchange in which parties are involved in transactions with each other. Market makers reduce transaction costs relating to searching for and negotiating with trading partners (Evans 2003). Second, audience makers create matches between advertisers and end users to enable advertisers to send messages to their desired target audience that comprises users of the platform. The platform owner needs to determine how much advertising is allowed in the platform, especially when it interrupts the consumers' usage (Rysman 2009). Third, demand coordinators enable members to interact by providing services in the background, such as operating systems and payment cards (Evans 2003).

Gawer (2009) divides platforms into 1) internal platforms, addressing one firm's offerings (e.g., Sony Walkman); 2) supply-chain platforms, addressing chain-wide execution (e.g., the Renault-Nissan alliance); and 3) industry platforms where the focus is on industry-level coordination (e.g., Microsoft Windows). A similar typology is presented by Piezunka (2011) who distinguishes that streams of the literature tend to focus on 1) product platforms; 2) industry platforms; and 3) two-sided markets. The difference is marked by the role of the platform sponsor: in the first, it offers products; in the second, it coordinates complements and end-users who might directly interact outside the platform; and in the third, it coordinates two sides interacting in a platform.

One of the most cited general platform classifications is that by Schmalensee and Evans (2007). It includes 1) exchanges, 2) advertiser-supported platforms, 3) transaction platforms; and 4) software platforms.

Exchanges include coordinating dyadic interactions between buyers and sellers; any stock exchange would qualify. On the Web, for example, auction websites such as eBay are included. Examples of advertiser-supported platforms include TV or radio stations that show content for free and monetize by selling advertising space. Online equivalents are, for example, search engines such as Google (see Salminen 2010). Transaction platforms, such as credit card providers, mediate transactions between merchants and consumers; PayPal is a good example on the Internet. Software platforms are tied to specific hardware, and sometimes referred to with the concept of *ecosystem*; for example, mobile application platforms such as Nokia's Ovi Store. Huang, Ceccagnoli, Forman, and Wu (2009) define ecosystems as communities of innovation networks in which industry leaders coordinate collective efforts of developers and other partners towards shared goals.

Second, technology-enabled platforms mentioned by Saha, Mantena, and Tilson (2012) include computer and mobile operating systems, online advertising networks, job boards, real estate brokers, electronic marketplaces, and payment systems, both mobile and online, such as Paypal. Technology plays a role in facilitating connections between supply and demand sides, and also computes optimal routes and allocations between parties, a property that is useful when mapping potential connections. Internet platforms are built on top of Web technologies that are typically based on open standards, thus excluding competitive strategies based on patents and standards, and enabling social connections and scaling effects associated with technology (for illustration, see Horowitz & Kamvar 2010).

Third, online platforms are a subset of technological platforms; they can also be termed Internet platforms (Sawhney et al. 2005) due to the fact that the Internet is the medium through which participants interact. Consequently, Web technologies play a major role in how match-making is executed by the platform owner, and also in how the platform scales; for example, very rapidly extending across national boundaries. Some authors also employ the term electronic intermediary (Bakos 1998). However, intermediation refers to a value chain deviating from the market-making function; for example, enabling parties to independently find one another (Evans 2003). Gazé and Vaubourg (2011) distinguish online auctions, traveling intermediaries, online media, massive multiplayer online role-playing games, and e-payment platforms.

Saha et al. (2012) mention the following online platforms: 1) electronic labor markets, 2) ecommerce sites, 3) online advertising platforms, 4) online auctions, and 5) group-buying platforms. Caillaud and Jullien (2003) point out that online platforms are able to monitor individual transactions, and therefore charge transaction fees tied to the number of interactions, not only access fees. Gazé and Vaubourg (2011) discuss another trait they perceive as typical for

online marketplaces: *side-switching*, which is changing roles from buyer to seller as it is easy, reversible, and has no financial cost. However, it is unclear if this feature only applies to online markets as, also in brick-and-mortar cases, one can act as a seller and buyer within the same market space (consider e.g., a flea market).

Conceptual classifications can be regarded as arbitrary[49] because typologies can employ alternative criteria while classifying the same phenomenon; neither being wrong nor correct (Kotha & Vadlamani 1995). For example, Schmalensee and Evans (2007) employ criteria such as the form of product (i.e., software platform), business model (i.e., advertiser-supported platform), and the operating level (i.e., transaction platform, which can be regarded as a form of infrastructure). Thus, we can posit that it is difficult to define platforms in a mutually exclusive way as they might be embedded, so that, for example, a software platform provides advertiser-supported products.

There are some reasons why the extant classifications are insufficient in the context of this study. First, although we can detach the embedded platform from its parent and examine it in isolation, depending on whether we are interested in the infrastructure level, business model, or type of interactions taking place within it, based on particularities in these dimensions, it can be argued that online platforms merit their own classification. For example, software platforms (Schmalensee & Evans 2007) would combine hardware and software, which is not relevant in pure online business[50]. This liaison arises from the hardware-software paradigm introduced by Katz & Shapiro (1985), and relates to the complementarity of the two; hardware being more valuable accompanied by useful software, whereas, clearly, software cannot be run without hardware. The result is a different kind of chicken-and-egg problem than the one analyzed in this study, and is often implied when explaining computer industry dynamics[51] (e.g., Boudreau & Hagiu 2009).

Second, many classifications employ a revenue model as the defining factor. However, the revenue model only explicates how the platform generates revenue (e.g., by advertising); this information is not very relevant for solving the chicken-and-egg problem. Much more central, in this respect, is examining why users join and participate in platform interaction, and even pay for access

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[49] In the sense that, although consistent mutually exclusive items, classifications can be equally valid but different.

[50] However, as previously noted, similar dynamics to other two-sided markets can be assumed; thus, the platform literature is highly relevant. Furthermore, some strategies applied in the mobile application markets by key players are associated with the fact they are also hardware vendors. Therefore, even if the application marketplaces can be modeled in isolation as their own two-sided markets, in some cases, theories might want to consider the hardware liaison.

[51] Clearly, the platform perspective would explain the difference between rivals through the concept of network effects: one is able to leverage them while the other is not.

and usage. For this purpose, the classification presented next considers potential motives of users of online platforms.

In an attempt to provide a specific classification for *online platforms*, combining both the digital environment and the two-sided structure, the following classification is proposed. Overall, it is based on the grounded theory analysis and thus on the nature of the startups examined in this study.

Table 7 Online platform types

Type	Sides	Focus of interaction	Industry example
Exchange platform	Buyers and sellers	Exchange motive / transactions	*eBay*
Content platform	Creators and consumers of content	Content creation and consumption	*Google*
Social platform	(one-sided)	Social motive	*Facebook*
Infrastructure	Providers and developers	Enable other products and services	*The Internet*

This classification matches well with the nature of startups sampled in this study (see Table 2). Note that the infrastructure platform is a special case which involves no interaction between parties. Infrastructure is compatible with Gawer and Henderson's (2007) definition[52] of a platform as a structure to build on top of, but not with Hagiu and Wright's (2011). In this study, interaction between parties involved in the platform is regarded as more important than hardware-level interaction, and thus the infrastructure model will not be considered in later parts of this study.

The exchange platform connecting buyers and sellers is the most widely documented case in the platform literature, and most authors refer to it when discussing platforms. Based on the literature review, especially in the field of economics, the focus is on marketplaces (i.e., exchange platforms). Some authors see a platform in the sense of infrastructure (i.e., enabling to be built upon), which is not the most fruitful approach when considering how the platform owner can solve business problems as a strategic agent.

There can be some overlap between the types. For example, Kim and Tse (2011) analyze knowledge-sharing platforms, which would classify either as

[52] "We define a product as a 'platform' when it is one component or subsystem of an evolving technological system, when it is strongly functionally interdependent with most of the other components of this system, and when end user demand is for the overall system, so that there is no demand for components when they are isolated from the overall system" (Gawer & Henderson 2007, 54).

content or exchange platforms depending on the type of interaction. If respondents are provided payments, not "payments in-kind" as in Mungamuru and Weis (2008), the interaction is exchange, and therefore the "laws of exchange" should apply. If, however, interaction is voluntary and driven by intrinsic motivation such as the status of knowing a lot, it is a content platform and visitors are interested in receiving content benefits. Furthermore, if there is a relatively stable community and users engage in lengthy discussions and roles, the platform can be classified as a social platform (Mital & Sarkar 2011).

The overlap problem can be solved by splitting the user motives into primary and secondary motives. For example, a person searching the Web to find information has a primary 'search intent' (cf. Schlosser, White, & Lloyd 2006), even though he/she might end up sharing the results of the search in a social platform. Therefore, even when they relate to content, primary motivations to visit a social platform can be of a social kind. For example, sharing content is arguably more about sharing (i.e., 'social intent') and less about content. As the purpose of this platform is to provide content, *most* people visit it because of that. However, *some* people might visit it for the primary purpose of sharing, or some other motive for social interaction. Thus, in our typology, exchanging content is a spillover effect, not the primary motive for participating in the platform.

This discussion is not merely semantic. In some cases, the secondary motive can become an even more powerful predictor of conversion than the actual motive of visiting the platform. For example, Oestreicher-Singer and Zalmanson (2009, 39) observe that "*in the context of music content, community activity is more strongly associated with the likelihood of subscription than is the music consumption itself.*" Furthermore, the interplay between content and social features can be a critical part in finding solutions to the *cold start dilemma* through spillover effects (see Chapter 4.4) and *remora's curse* (Chapter 4.7)[53]. If the motive for participation is known, the platform owner can provide appropriate incentives, including implicit incentives (e.g., social satisfaction) and explicit incentives (e.g., monetary compensation), or a combination of both (Ren, Park, & van der Schaar 2011). A place of exchange can be regarded as being subject to different rules and "economic laws" (i.e., type of reciprocity associated with interaction[54]) than a content platform.

Therefore, motives for interaction differ in content platforms and social platforms. Different motivations are also applied in Luchetta's (2012) typology

[53] Through *envelopment* (Eisenmann et al., 2011) or embedded platforms, in which a platform of a different type is built on top of the host to gain access to its user base.

[54] For example, Porter (2004) argues that "*[r]elationships in networked-based communities are often of short duration and driven by utilitarian needs*."

of platforms. By adopting his style of presentation, online platforms can be specified as follows.

Table 8 Online platforms, interaction, and goals

Platform	Interaction	User A	Goal of A	User B	Goal of B
Content	Consumption	Consumer	To consume content	Contributor	To contribute content
Social	Communication	Individual A	To connect with B	Individual B	To connect with A
Exchange	Transaction	Buyer	To buy	Seller	To sell

It follows that the purpose for interaction is symmetric for social platform users, and the resulting problems are coordinating problems (e.g., who is online) that the platform will efficiently solve (e.g., by storing messages). The same applies to an exchange platform; the needs are symmetric, although inversely, so that they complement each other. However, participants in a platform relying on user-generated content face some asymmetry; there are users interested in consuming content and others who produce it. This suggests some dynamics that will be considered in Chapter 4.4; namely, the goals of the two sides cannot always be solved by simple match-making.

In sum, exchange platforms address buyers and sellers whose *primary* interaction is a transaction (i.e., trade). Content platforms comprise users contributing content and users consuming it[55], and content-related activities (e.g., consumption, reading, writing, and watching) are the type of interactions for which the platform exists. Social interaction (i.e., discussions, chats, messaging, and communication) defines social platforms and their users. A social platform is one-sided when the user is only interested in others sharing his/her traits or interests, whereas, in a dual-sided social platform, the user seeks a complementing party.

[55] Whether they are seen as one heterogeneous group or two distinct groups (i.e. one- or two-sided platform) is another arbitrary choice enabled by flexibility of the two-sided framework.

3.4 Online platforms and user generation

3.4.1 Why is UG included in the study?

In this chapter, the author outlines an *ideal user generation model* to capture the potential benefits of user generation (UG) targeted by startup founders. Wishful UG effects are characteristic to the startups in the sample, and influence the emergence of strategic problems and their solutions. User generation in the theoretical treatment enhances the outcome more than omitting this critical aspect, which is why UG is considered a part of the startups' business logic.

The lack of desired behavior from users is, based on analyzing the post-mortem stories, associated with the failure outcome, and therefore needs to be considered in this substantive theory of strategic problems. The online platform typology and the ideal UG model are Internet-based specificities, and considering them deepens the perspective on platform strategies in the online business context.

3.4.2 User-generated content

In the literature, UG effects are often approached through the concept of user-generated content (UGC), also commonly utilized by startup founders. A widely accepted definition (e.g., Hermida & Thurman 2008; Ochoa & Duval 2008; Banks & Deuze 2009) can be found in Wunsch-Vincent and Vickery (2007), defining UGC as a) content made available through the Internet, b) involving creativity by end-users of a Web service, and c) non-commercial motives of creation.

Earlier papers relating two-sided markets/platforms with UGC include Albuquerque, Pavlidis, Chatow, Chen, and Jamal (2012), who compare firm-initiated promotion with user-initiated promotional activities, and Evans (2009b), Ren et al. (2011), and Calvano and Jullien (2012) who consider UGC as a means to connect consumers and advertisers. Yoo (2010) also mentions UGC in his treatise on network providers and two-sided markets, but only to differentiate it from peer-to-peer networks. Kim and Tse (2011, 42) give an example of UG effects in a platform context:

> *"[A] knowledge-sharing platform may overcome an initially small membership by starting with some prebuilt knowledge database to attract new questioner members. New questions posted by these questioners will attract some answerers, whose answers will in turn attract more questioners. This cyclic process can*

> *help a knowledge-sharing platform to overcome the chicken-and-egg problem that is commonly found in a general two-sided market."*

However, none of these papers consider the theoretical implications of UG in online platforms, or *fully* extend its meaning beyond content-related activities. First, considering content only as content, as opposed to a complement, does not capture its implications for online startups. Following Chapter 3.1, apart from installed user base, complements are associated with network effects; thus, the more content in a content platform, the more valuable it is to its users, all else being equal (cf. Varian 2003). At a general level, the same applies to interaction: its volume positively correlates with the usefulness of a platform (see Chapter 4.5).

Second, the functions of UG are not limited to user acquisition as is typically considered (e.g., Kim & Tse 2011). In contrast, the users are seen to adopt more roles that influence the viability, growth, and success of a platform. These functions are discussed in later sections. Third, even if Web 2.0 marked a "revolutionary" disruption of the earlier "version" of the Web (see O'Reilly 2005), the notion of UG has not developed much since. For example, Beuscart and Mellet (2009) note that Web 2.0 is associated with UGC sites, blogs, social news sites, and social network sites. UG, therefore, is commonly perceived as "video and photo sharing" or similar activities, the meaning of which to the platform is not regarded as critical. However, the importance of UG seems obvious when observing the scale and diffusion of online platforms in the real world. For example, consider Facebook, originating from a small community and, a few years later, having over one billion registered users (Shaughnessy 2012)[56]. Such results were obtained without advertising, very minimal user support and staff-per-user ratio (Kirkpatrick 2010), instead relying on UG effects.

3.4.3 UG in online platforms

When, therefore, considering UG not from a static perspective but as a complement, a new definition is needed. As network effects are highly important for two-sided markets, a definition for UG relating to platforms is proposed:

> *User generation is provision of content or other direct or indirect benefit through actions of a user of an online platform to*

[56] Edwards (2013) notes, correctly, that a portion of this includes fake profiles and double registrations; nevertheless, the growth is phenomenal.

> *others users characterized by the platform owner's attempt to monetize it.*

This definition is compatible with the two-sided framework in the following ways. First, it states that users provide benefit for other users, thus implying network effects (e.g., Katz & Shapiro 1985). Second, the benefit can be either direct or indirect (Shy 2011), based on the type of interaction (e.g., communication vs. trade) and the mechanism of benefit provision; for example, peer-marketing can increase the installed user base, which indirectly benefits other users. It can be seen that members of the same sub-group or dyad of a platform benefit from direct interaction, whereas participants included in another group, such as advertisers, the platform owner, and other potential stakeholders, might derive indirect benefit from the existence of the user base (cf. Clements 2004). Third, it includes the aspect of the platform owner aiming to *monetize* the UG outcomes, which is compatible with Rochet and Tirole's (2005) and Evans' (2003) perceptions on a commercial platform and the "internalizing of externalities".

After establishing this definition, the totality of UG effects, which are no longer limited to content, is explored. In this conceptual inquiry, suitable theoretical frameworks are applied, reaching beyond the immediate platform literature. This is necessary to base our theoretical argument on the appropriate literature. As noted, the platform literature is lacking in this aspect, as it does not consider UG effects with the same gravity that, as the analysis revealed, is shown by platform startups. Based on the grounded theory (GT) analysis, founders implicitly assume these UG benefits in their platform strategy.

3.4.4 Ideal user-generation model

User generation was an essential concept for the studied online platforms, and its emergence can be employed to explain inadequate strategic responses by founders. To understand the logic applied by founders, we generate a comprehensible model going beyond what is understood in prior platform research as the *potential* benefits of UG (i.e., UG effects).

'Ideal' UG refers to properties associated with UG in the online context. Namely, it is the optimal model at which startups aim, but which most will not reach, as proven by the sample. Central to this idea is that UG aims to replace functions typically assumed by the firm, and delegates them to the user base. While the full treatise of this notion goes beyond the scope of this study, the

user base is, in the ideal sense, utilized to extend the "boundaries of the firm"[57] (Coase 1937). Namely, startups applying this implicit and theoretical model aim at 1) minimizing human intervention and labor cost through designing a technological solution (i.e., the platform); 2) facilitating the creation of socially desirable high-quality content, or activating a *virtuous cycle* of network effects; 3) scaling their technology and business beyond the limits of the startup's internal resources with the help of platform users; and 4), above all, delegating critical business functions to the user base.

The following figure depicts the ideal model of UG effects.

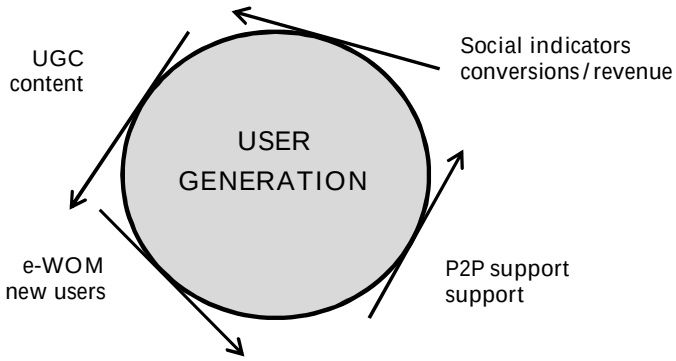

Figure 9 Ideal user generation model

The ideal UG model is associated with network effects, so that the content actually forms a complement in the platform, making it more valuable to all users (Arroyo-Barrigüete, Ernst, López-Sánchez, & Orero-Giménez 2010). In other words, the first set of users' actions is expected to initiate the virtuous cycle. More precisely, in the ideal UG model, it is implied that the user internalizes some of the critical tasks of the startup that, in turn, by externalizing them, will reach better operational efficiency. The user base is, in theory, able to produce effects several magnitudes larger than the startup's resources would enable; thus, it can be regarded as the startup's resource. This can be proven by assuming that the cost to the platform owner to create content, marketing, customer service, and other functional activities necessary to launch and maintain the platform increases with, for example, labor costs and marketing investments, and thus has a realistic limit (i.e., *budget*), whereas similar

[57] It goes beyond the study's scope as the study cannot prove that firms/startups systematically delegate their critical functions to users, which is why the model is ideal or theoretical. However, startups that apply state-of-the-art methods to survive seem to indicate this possibility. This is definitely a topic for further research.

activities without transaction cost due to platform coordination, self-organization, or labor cost are effectively cost-free for the platform owner.

Therefore, harnessing UG and network effects leads to a virtuous cycle in which the willingness to adopt increases as a function of earlier accepted invitations, which then increases the willingness, for example, to send more invitations (Trusov, Bucklin, & Pauwels 2008). This is compatible with network effects as defined by Farrell and Klemperer (2007, 2007): "*there are network effects if one agent's adoption of a good (a) benefits other adopters of the good (i.e., a 'total effect') and (b) increases others' incentives to adopt it (i.e., a 'marginal effect')*." Through UGC, the startup aims to increase the 'total effect', while user-generated user acquisition is planned to increase the 'marginal effect'. Given that the diffusion/propagation has an upper boundary on the limits of a market (Salminen & Hytönen 2012), the outcome can become a winner-takes-all situation (Noe & Parker 2005) in which the platform replaces its rivals as a side-effect of expansion (cf. Facebook replacing MySpace). This effect is noted by Arroyo-Barrigüete et al. (2010, 643), who describe it as a "*re-alimentation schema that makes strong products ever stronger (virtuous circle) and weak products ever weaker (vicious circle).*" This exponential inflationary trait can be explained by the "small world" characteristics of the Internet that hosts online platforms (Schnettler 2009), and the desire to propagate messages, such as invitations and content. Zhang and Zhu (2011) find that social effects lead to an increase in contribution when the installed base of Wikipedia increases, therefore supporting UG's virtuous cycle.

The ideal UG model is grounded in the data; namely, in the assumptions of the founders. They implicitly and explicitly devise their businesses to support the idea of UG as this is perceived to be the interaction taking place in the platform. Indeed, the concepts of interaction and UG are closely associated and refer to the same phenomenon, which is the activity taking place in the platform. Note that the ideal UG model differs greatly from what is understood in the literature by "user-generated content". Namely, the literature examines UG almost proprietarily as a function of content creation, whereas this study's definition, derived from the two-sided platform literature, extends far beyond mere content.

3.4.5 Functional view to UG

To provide a more granular perspective to the idea, general functions of a firm are related to UG. The following list parallels an organizational structure (i.e., *the firm*) in which functions mostly have a clear purpose (Mathur 1979). The analogy becomes even more distinct when presenting a functional comparison.

Table 9 Functional comparison of users and the firm

User function	Firm function
Content creation	Content production
Moderation	Quality control
User acquisition	Marketing
Support	Customer service
Feedback	Market research

The paralleled functions are general functions in which many firms, including platforms, need to engage. A platform needs to provide content or liquidity (Evans 2009a); it needs to moderate the quality of UGC or other complements for spam (Moh & Murmann 2010), or low-quality complementors (Boudreau & Hagiu 2009); it needs to provide support/customer service for its users/customers (Rochet & Tirole 2003); it *should* take user requests into consideration when modifying platform design (Stanoevska-Slabeva 2002) and, thus, spontaneous feedback by the *community* or platform users is a form of market research; and, most importantly, it needs to acquire users/customers, that is, conduct marketing (Eisenmann, Parker, & Van Alstyne 2006). These are general functions that need to be organized in one way or another; according to the UG model, users are given most if not all of these tasks.

As explicated, users obtain control over content generation that enables not only cost-free production, from the startup's perspective, but a quality that matches the audience's tastes[58]. To ensure quality, users monitor each other and report negative behavior. By automating the system to respond to user reports, the startup avoids any labor relating to quality control[59]. Moreover, in a platform demonstrating community traits, users face social disproval from other users as a consequence of misconduct, which they are therefore likely to avoid (Sheridan 2011). In exchange, users help each other to learn the platform, and also mediate commonly agreed rules of behavior. Support can arise from earlier platform-specific investments by other users who behave in an altruistic way (Boudreau & Lakhani 2012).

Arroyo-Barrigüete et al. (2010, 644) refer to the "learning network effect", which "*derives from the fact that an increase in network size will increase the number of users with specific knowledge of the related technology.*" Essentially, expert users provide a form of "after-sales service" to new users,

[58] Kim and Tse (2011, 41) describe this effect: "*[a]s a result of knowledge sharing between members, knowledge-sharing Web sites have an accumulated knowledge database of answered questions that attracts people who have questions.*"

[59] In its simplest form, there are report functions. It is more complex when the user becomes a moderator; that is, an active agent who scouts the platform for low-quality interaction.

thereby increasing the platform diffusion. According to this argument, the presence of peer support can facilitate both *ex ante* adoption and *ex post* interaction.

User-generated invitations, a form of peer marketing (see e.g., Smith, Menon, & Sivakumar 2005) are, in fact, also beneficial for other users, given they match their preferences; if not, they will be interpreted as unsolicited messages (i.e., spam). This is because they reduce the recipients search cost for interesting content. Therefore, sharing links of content among peers is an efficient dissemination mechanism and, in theory, resolves the need for any other marketing[60], which will be revisited in Chapter 4. It is widely acknowledged that peer-to-peer propagation plays a critical role in the diffusion of most online platforms that are currently dominant, and that this effect relates to UG (Albuquerque et al. 2012, 406):

> *"[C]ontent creators, besides populating the platform with materials, serve as marketing agents by advertising their own content or generating referrals and links to uploaded content in other websites. Given the interconnectedness and viral community structure of the Internet, the relation between marketing activities by the firm and the decisions of content creators is likely to play an essential role in the development of most user-generated content platforms."*

Moreover, consider the customer acquisition function that, as per the ideal UG model, relies at least partly on search engines providing a marketing channel by automatically indexing content, and thereby providing free organic traffic (i.e., visitors) to the website, a process here termed *search-engine externality*[61]. Host platforms can provide a stream of users; that is, act as marketing channels based on actions of the startup and in respect to the platform type (e.g., content platforms → *Google traffic*; social platforms → *Facebook traffic*). This strategy is similar to envelopment (Eisenmann et al., 2011), and its merits and risks are discussed in Chapter 4.7.

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[60] Interaction that provides direct network value is described by Oestreicher-Singer and Zalmanson (2009, 14): "*small acts of structured contribution that can be perceived as adding value to the user's own content consumption but that can also add value to the community […] for example, tagging content with keywords to ease its discovery, or rating content in order to promote its popularity and reputation.*"

[61] This is an externality as it is not a reason for interaction between content consumers and content creators. For the startup, it represents an externality that can be internalized.

3.4.6 Implications to startups

What does the ideal model imply for a platform startup? First, the immediate costs of providing the platform are radically reduced. Second, effective emergence of UG implies self-organization, similar to projects such as Wikipedia (see Stvilia, Twidale, Smith, & Gasser 2008) and Linux (Benkler 2002). Third, transaction costs relating to coordination of the business are externalized, meaning that the users will begin to coordinate *for* the firm (Hagiu 2006).

In particular, UG can reduce the cost of scaling; namely, increasing the connections and activity in a platform. Imagine the platform owner's cost structure comprising user acquisition, denoted *a*, platform maintenance, denoted *m*, and user support (i.e., customer service), denoted *s*. To grow the user base, the platform owner incurs the cost of *a* multiplied by each acquired user. If the user base grows by a factor of *k*, the support cost also grows by this factor. However, if the user acquisition and support functions are performed by the current user base at their own expense (i.e., time), only the fixed[62] cost *m* remains for the platform owner. By applying UG, the platform owner is able to maintain its *neutrality*, thus avoiding costly marketing and support activities while monetizing the increased usage of the platform driven by UG's exponential dynamics and network effects. For example, a content platform exists to produce and disseminate content to other users. In a regular website, the owner creates the content; in a platform, it originates from the users. The startup as a platform owner is not a 'side' of the market but still benefits from the content, as it helps to attract more users on which the platform owner can capitalize (i.e., *monetize*).

As previously described, self-moderating effects reduce a startup's workload when scaling to millions of content units. By reducing the transaction costs of its members, a platform is able to attract users (Hagiu 2006). This fact has been established in the platform literature. However, less attention have been paid to other costs. In particular, introducing UG reveals its importance for online platforms, but also makes it easier to understand the founders' logic in pursuing UG in their platform strategies. Hagiu (2006, 2) claims that "*any MSP [multisided platform] performs one or both among two fundamental functions: reducing search costs and reducing shared transaction costs among its multiple sides.*" By combining parties of interaction, the platform is able to lower the cost of finding matches, negotiating, and validating their quality. In a UG platform, these activities originate from the user base. Search costs for users are lowered because they are able to find new interesting content or

[62] In this example, platform maintenance cost is assumed to be fixed; for example, startups applying cloud-based hosting can convert their server costs from fixed to variable.

connections, and the benefit is sustainable because the platform keeps auto-updating as a consequence of other users' actions. Further, the platform does not need to invest in advertising because users promote the service to other users.

Finally, startups can integrate mechanisms into their platform design to nurture UG activities, such as 1) community building, 2) viral mechanisms, 3) search-engine externalities, and 4) frictionless sharing (Darwell 2013). If these efforts are either built-in to the product or come at minimal cost by inviting friends and sending emails to gather the critical mass, then it is assumed that marketing is free and the customer acquisition cost equals zero. These kinds of economy makes it possible to replace paid match-making services. Moreover, indirect monetization might be a requisite to 1) maintain social norms, not economic norms (Fehr, Kirchler, Weichbold, & Gächter 1998), and 2) encourage reciprocity; as users get a free platform, they might feel the need to contribute or "pay" through UG. Susarla, Oh, and Tan (2012) studied diffusion in a UGC platform (i.e., YouTube) and concluded that diffusion is influenced by social contagion rather than user heterogeneity. Clearly, user-to-user dynamics play a role in the adoption/diffusion of a platform, and therefore should be considered in relation to the chicken-and-egg problem.

3.4.7 Limitations of UG

In sum, within the online platform, users are *expected* to engage in multiple roles such as content creation, moderating (i.e., quality control), customer acquisition (i.e., inviting other users), and providing support (i.e., customer service). As a result, the required input from the platform owner is, in theory, greatly reduced through coordination features programmed into the platform. Indeed, in an ideal situation, the platform becomes self-sustaining and self-propagating, while the platform owner is still able to internalize some of the benefits from user interaction, typically indirectly (e.g., by selling data or advertising space), whether the interaction is content creation and consumption, exchange, or social interaction.

Clearly, this is where the problems begin, as the ideal UG model often remains just that – ideal. The rest of this study, especially the section discussing dilemmas, demonstrates some of the central challenges in applying UG as a critical part of a platform startup's business model. The ideal model rarely, or almost never, materializes[63], and in practice the platform owner's intervention

[63] The examples provided earlier suffer from survivorship bias, which means that they are not adequate for generalizing empirical meaning. However, nothing prevents taking them as part of a theoretical model, given that the limitations are properly understood.

is needed in most parts to guarantee progress and frictionless operation. However, the few examples, in addition to assumptions of transaction-costless functioning, of the ideal platform are compelling thoughts. Therefore, although it might seem counterintuitive with hindsight, ignorance concerning marketing[64] as exhibited by several founders in the sample, and reported afterwards[65], has logic; had users accepted those critical functions, the startup might have succeeded. The ideas that the users replace marketing and that search costs are categorically low are debunked in Chapter 4.5 and Subchapter 4.6.2 respectively; "no need for marketing" is challenged in Chapter 5; and the negative effects of removing quality control from the platform owner are discussed in Subchapter 4.5.2. Therefore, despite its theoretical merits, the ideal UG becomes dangerous when applied literally.

Overall, the ideal model leaves many aspects uncovered and relies on unrealistic assumptions of users' willingness and ability to manage critical functions of the firm. In its pure form, the winner-takes-all outcome can also be unrealistic, as it fails to consider multihoming behavior and other aspects of adoption apart from network effects, such as differentiation through features or marketing. Nevertheless, it helps us to understand how platform startups approach strategic thinking. Understanding UG is important as it is associated with startups' strategic decision-making. For example, consider Facebook, Twitter, and Google that have accumulated users not by paying but by peer effects. These success stories form *reference points* that orientate founders towards choosing similar elements in their own startup[66]. This effect is close to an *anchoring bias* (Bunn 1975) according to which decisions are made based on prominence and not averages or suitability of the case context.

Finally, some UGC-based companies (e.g., Twitter) are struggling with monetization, which indicates that even a working UG model might not be sufficient to guarantee economic sustainability. As such, *popularity does not indicate profitability* (see Chapter 4.6), and solving the chicken-and-egg problem through UG might leave a firm vulnerable to other strategic dilemmas. With this premise in mind, the study will now move to discuss the strategic problems of platform startups in more detail.

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64 *"The next issue to tackle was marketing. How do we make them aware of it? We decided to use blogs. What better way to expand than to piggyback on an existing network? […] It rarely works. Everyone wants to do it, but it isn't easy to get bloggers to write about something."* (May 2007).

65 *"We fell into the 'build it and they will come' school of thought (although even when they came, we still weren't in good shape)."* (The Chubby Team 2010).

66 *"When it came to certain website design elements, we didn't know what customers wanted […] and so instead, we thought 'let's take elements from sites we like and tweak them' and we'll get the same magical effects on our site that they've gotten. Wrong. Features don't work in a vacuum. They work because you take time to understand your customer and then build features to accommodate them."* (The Chubby Team 2010).

4 STARTUP DILEMMAS

4.1 Introduction to dilemmas

4.1.1 What is meant by dilemmas?

A ‘dilemma’ is a situation of conflict, in which a decision maker usually faces two mutually exclusive choices that both lead to a seemingly undesirable outcome. In the Oxford Dictionary (2013), dilemma is defined as “*a situation in which a difficult choice has to be made between two or more alternatives, especially ones that are equally undesirable.*” Although, in everyday life, individuals often face contradictory decision-making situations, researchers in academia tend to model decisions through preferences and weights; thus, outcomes that are perceived more costly are avoided while those with higher expected gains will be sought (e.g., Layard, Layard, & Glaister 1994). In psychology, one speaks of *cognitive dissonance*, a state of contradictory emotions relating to situations, persons, or outcomes (Festinger 1962).

In economics, scholars examine various *tradeoff situations* (e.g., Ball et al. 1988; Cohen & Klepper 1992). In particular, economists apply game theory to examine actors’ strategic choices under a set of assumptions; for example, the prisoner’s dilemma (see Axelrod 2006) is a famous game-theoretic problem that is structurally close to the cold start dilemma, presented in Chapter 4.4, in that participants are driven to a dissatisfactory solution. In the strategic management literature, strategic or *wicked problems* (Mason & Mitroff 1981) are characterized by associations with other problems, recursive feedback, environmental uncertainty, ambiguity in definition, conflicting tradeoff in their solutions, and societal constraints upon theoretically effective solutions (Lyles & Howard 1988). Proper definition of a problem and assessment of the strategic situation are regarded as important for finding a solution (Klein 2012), although individuals are perceived to be constrained by their cognitive capabilities and *bounded rationality* (Simon 1956).

4.1.2 The use of dilemmas in this study

Here, the concept of dilemma will be applied to examine various challenges to platform startups. More precisely, four startup dilemmas are conceptualized in

this study that derive from the material through the inductive grounded theory approach, and formed through discussions with founders (i.e., contextualization), and the support from the theoretical framework (see Chapter 2). Therefore, the origin of these dilemmas is inductive while their conceptualization and treatment follow a deductive process, based on the aforementioned contextualization and support from the literature.

A typical dilemma for online companies is the monetization of their offerings. The assumption by founders can be termed *expectation of free;* more precisely, they believe consumers prefer free Web services to paid ones because, it is argued, consumers are very reluctant to pay for digital goods. Note, this is an assumption that drives founders' thinking, regardless of whether it is true or not. If this assumption is true, startups monetizing their products directly risk *commercial flight* as soon as fees are introduced. Due to *hypercompetition* (D'aveni 1994) and *low switching cost*[67], startups have few means with which to generate lock-ins. However, they need both users and revenue. Therefore, they offer the product for free to solve the dilemma of adoption, and everything is presumably fine.

Except that, consequently, they fall into a *free-rider trap*; a paradoxical situation in which the success of a product, measured by installed user base, leads to growing economic losses[68]. In other words, the demand for a Web service is high while financial returns are low due to free provision (Lee & Brandyberry 2003[69]). Formally, we can argue for the logic of Shy (2011), in that startups form a belief of willingness to pay; if all startups assume that willingness to pay is zero (i.e., demand is zero with any price), this is a case of equilibrium and the belief becomes self-fulfilling (Evans 2002).

In this simple illustration, three lessons can be found. First, that dilemmas are associated with assumptions in real human situations. Second, that they are often related, so that one problem and its solution lead to a new problem; thus, there is a need for new thinking. Third, that solutions are most often tradeoffs between "two evils" or the selection of only one desirable option, such as when selecting between users or revenue. Finally, one can observe that dilemmas offer a fruitful ground for various conceptualizations; for example, the *free-rider trap*. This dimension makes them appealing to various groups,

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[67] Switching cost is defined here according to Shy (2011, 120): *"When firms capture market share before they encounter competition, the network effects that are associated with their installed bases generate switching costs, which are the costs of switching from one brand to another incompatible brand"*. Refer to an alternative definition in Subchapter 4.6.1.

[68] This is easy to prove by assuming that each user costs to acquire and serve while producing no revenue in return. In such a scenario, exponential growth leads to exponential losses.

[69] *"There are ample examples where commonly employed metrics (unique visitors, page views, sales, etc.) suggest success while companies struggle to obtain profitability"* (Lee & Brandyberry 2003, 10).

both researchers and managers. In fact, similar assumptions are applied in Chapter 4.6, in which the 'monetization dilemma' is discussed in depth.

4.2 Dilemmas in the platform literature

Several dilemmas have been identified in the platform literature. The most important of them (Rochet & Tirole 2003), the chicken-and-egg problem, is part of this dissertation, separated into cold start and lonely user dilemmas. This issue is discussed thoroughly in Chapters 4.4 and 4.5. This section will provide a literature overview on other strategic problems in the platform literature.

In general, Eisenmann et al. (2006) mention three challenges faced by a platform owner: 1) the pricing problem, or setting prices so that overall profit is optimized and takes two-sided dynamics into account; 2) the winner-takes-all problem, which is topical for platforms not dominating due to a tendency of markets to tip, which is the tendency of one system to dominate its rivals in popularity after gaining an initial edge (Katz and Shapiro 1994); and 3) the envelopment problem, involving rival platforms integrating the platform as part of their offering and thus capturing users. These issues are discussed in the following chapters with regard to dilemmas that emerged from the material. Envelopment can be perceived as a solution for startups to fight dominant platforms with regard to the cold start dilemma, whereas the price-setting problem relates to the monetization dilemma (see Chapters 4.4 and 4.6).

Cennamo and Santalo (2013) discuss two particular problems: *coring versus tipping* and *positioning dilemma*. Coring implies exclusive contribution (e.g., apps exclusivity) by complementors to a specific platform[70]. If the complementor gives exclusive rights to the platform owner, he/she loses the opportunity to multihome; therefore, there is conflict of interest between the platform owner who prefers exclusive complements and the complementors who prefer multihoming to maximize profits. The more there are a) exclusive complements and b) complements overall, adding to intra-platform competition, the less feasible it is for new entrants to join; thus, the coring dynamics are against tipping dynamics (Cennamo & Santalo 2013).

In a similar vein, Lee (2013) discusses *exclusivity* as a strategic problem; when possible, forcing exclusivity is beneficial to the platform owner. However, this is done at the expense of competitiveness. If gains from an

[70] Gawer and Cusumano (2008) define the terms as follows: "'*Coring' is using a set of techniques to create a platform by making a technology 'core' to a particular technological system and market. 'Tipping' is the set of activities that helps a company 'tip' a market toward its platform rather than some other potential one.*" Cennamo and Santalo (2013) employ these terms in an applied sense.

exclusive platform fall short of combined gains from other smaller platforms, rational complementors will switch. Therefore, any case with several equally or near-equally strong rival platforms that requires exclusivity from third-party complementors might be ineffective. Modern app marketplaces, for example, tend not to require exclusivity (Hyrynsalmi et al. 2012). Multihoming is also typical for video game platforms, in which game makers publish their titles on many platforms simultaneously (Idu, van de Zande, & Jansen 2011). However, there are exclusive first-party titles that do not prevent third-party publishers from multihoming (Clements & Ohashi 2005). However, as the platform engages in direct competition with its complementors by offering first-party supply, there is a conflict of interests. If first-party titles comprise the majority of sales within a platform, third party vendors have less incentive to join than if there were no exclusive first party titles. This, as argued, forms a dilemma of first-party exclusivity versus non-exclusivity (Lee 2013).

Another strategic problem relating to complementors is how *collaborative versus competitive* it should be in terms of complementors (Economides & Katsamakas 2006). By definition, a platform can be either neutral or competitive (Hsiao 2003). If the platform owner competes with application providers, future providers have less incentive to join as, when given a choice, they are likely to avoid predatory platform owners. However, assimilation through acquisition might be regarded as preferable from an economic perspective, as proved by several purchases by dominant online platforms (e.g., Facebook acquiring Instagram; Google acquiring Jaiku). Huang et al. (2009, 3) refer to this problem as "*the fine line that platform sponsors must walk between maximizing profits and leaving sufficient residual profit opportunities to encourage complementary innovation*." They mention that absorbing complements can increase a platform owner's profit in the short term while discouraging other complementors from making platform-specific investments. The strategic problem of the complementor is avoiding to be absorbed or made obsolete by integration into the core platform (Huang et al. 2009).

A related problem discussed by Hagiu and Wright (2011) is *disintermediation*; when the platform has performed its duty and matched two member groups (e.g., buyers and sellers), the two can, in some cases, continue their interaction without utilizing the platform, thereby eliminating the possibility of lifetime revenue. Thus, the following strategic dilemma can be formulated: if the platform owner enables transparency and uncontrolled communication among its members, it receives more interaction because it is easier for members to interact; this is beneficial for growth but leads to loss of lifetime gains. However, if the platform enforces non-transparency and strict control on communication between members, it can retain interaction within the platform at the cost of interaction levels (Hagiu & Wright 2011).

Relating to quality, Wu and Lin (2012) discuss the problem of *governing diversity*. There are multiple problems associated with diversity, which is desired by the demand side but problematic for the supply side. One problem is that the more competition focuses on a particular niche, the less overall benefit the platform owner receives. Competition is likely to drive down prices and platform owner's profits, insofar as they depend on the pricing of its complements (e.g., through revenue sharing), while intensive focus on particular categories of complements foregoes long tail effects; that is, larger sales volume based on diverse tastes and needs of end users. The second problem is the issue of quality. The platform's reputation is affected by its complements' spillover effects, so that reputable and popular complements elevate a platform's image, whereas low-quality complements reduce its appeal to end users. These problems are not dilemmas, as they lack contradiction. However, they require proper strategic response in controlling quality without repelling complementors, and encouraging variety in terms of niches and categories to fulfill different end-user needs and thus reap long tail benefits. Wu and Lin (2012) propose discriminatory support based on quality to enhance heterogeneity that, in their model, leads to higher overall profits for the platform owner.

The *positioning dilemma* assumes two rival platforms, *a generalist* and *a specialist*, focusing on mass markets and niches respectively (Cennamo & Santalo 2013). To differentiate from the competition and create a distinct positioning in the minds of users, the platform must decide between the two approaches. If it chooses the generalist, it will lose distinction, and a potential niche market. However, if it chooses the specialist approach, it risks losing users who are interested in both generalist and specialist content. Because of winner-takes-all dynamics, users are inclined to adopt the generalist platform, with widest selection of content (Cennamo & Santalo 2013).

Reisinger (2004) mentions a strategic problem relating to *subsidization*, a common strategy in two-sided markets. The competitive dynamics can lead to a prisoner's dilemma situation in which competing platforms set negative prices, thus eroding their profits (Reisinger 2004). However, it is unclear whether this is simply a manifestation of competition in general, in that competition tends to lower prices and profits, or a unique problem for platforms. Nevertheless, its effect can be seen in the analyzed startups that typically applied an indirect monetization model without, however, a working plan to extract sufficient revenue from either side (see Chapter 4.6). Relating to indirect monetization, and particularly to the *audience maker model* (Evans 2003), a special strategic dilemma takes place when the demand side perceives advertising negatively but is employed as a monetization model. Logically, the more advertising the end users see, the more revenue the platform owner earns, although at the cost of end users' dissatisfaction (Anderson &

Gabszewicz 2006). Therefore, the dilemma involves setting the level of advertising so that it fulfills both economic goals and, if not serving, at least not repelling users from the platform.

Church and Gandal (2004) identify four types of demand-side issues relating to platforms: 1) *coordination problems*, 2) *tipping/standardization*, 3) *multiple equilibria*, and 4) *lock-in*. They explain coordination problems from the customer's perspective, so that a customer choosing the wrong platform or standard risks "being stranded" as the expected network effects do not actualize (Church & Gandal 2004). There is a coordination problem because the customers cannot communicate their willingness to join *ex ante*, and therefore each is hesitant to join. As can be seen, this is indeed the chicken-and-egg problem (e.g., Evans 2009a). Customers cannot redeploy their platform-specific investment towards adoption of another platform. It is unlikely, however, that the platform owner would be able to exercise power because users simply have no incentive to stay, despite any sunk cost. Thus, the *hold-up problem* is unlikely to arise (cf. Klein 1998). The choice of the platform is a demand-side strategic problem; it helps understand why users are cautious when adopting platforms. In tipping, after a particular threshold, one platform becomes dominant and all users convert to being its customers (Shapiro & Varian 1998).

Tipping becomes a problem if inferior technology is chosen, in which case the opportunity cost is the loss of superior technology in achieving platform users' goals (Church & Gandal 2004). The Qwerty keyboard layout is an often employed example that, according to some, is not the optimal layout in terms of writing speed but is practically impossible to replace due to its wide adoption; that is, network effects (Parker & Van Alstyne 2010). Once a standard has been widely diffused, it is hard to abolish; however, before that, its dissemination is difficult due to the chicken-and-egg problem. In the literature, this is referred to as the standardization problem (Besen & Farrell 1994; Weitzel, Beimborn, & König 2006). *Multiple equilibria* is the opposite of tipping, so that customers are unable to commit to any competing platforms due to fear of choosing the wrong one (Church & Gandal 2004). In this case, all competing platforms lose as adoption is delayed to the last possible moment.

Finally, lock-in can become an issue for users adopting the winning design (Church & Gandal 2004). Multiple types of power play can arise; for example, the aforementioned hold-up problem whereby the platform owner can raise prices as long as the switching cost remains higher or there are no *de facto* replacements, or the quality of the platform's operations or technology might suffer due to lack of competition. These effects are similar to monopoly, and are naturally associated with locked-in customers (Farrell & Klemperer 2007).

As can be seen, the platform literature has discussed a variety of strategic problems relating to strategic choices of platform owners, complementors, or

demand-side users. The dilemmas presented here were identified through a literature inquiry and represent the current state of research. However, any number of new dilemmas can be created based on alternative situations. This study focuses on four specific strategic dilemmas that are presented in the following chapter. The four dilemmas emerged from the GT analysis, and are chosen because they represent the issues identified by the studied platform startups' founders. Moreover, they seem to respond to the platform literature, in which the chicken-and-egg problem typical for startups is central.

4.3 Dilemmas emerging from analysis

4.3.1 Results from the black box analysis

The following figure reveals a model of the "black box" of failure (Chapter 1.2) based on grounded theory (GT) analysis. After deciding to focus on dilemmas (i.e., emergence of the core category), selective coding was conducted to find support for dilemmas, with new dilemmas also being found.

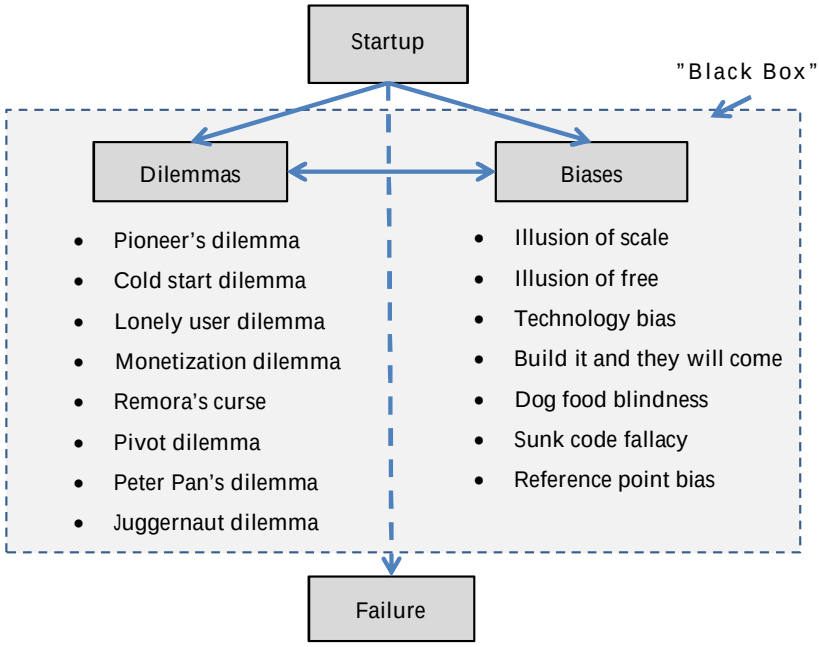

Figure 10 Exploratory outcomes – opening the black box of failure

The purpose of Figure 10 is to show the larger framework in which the chosen dilemmas are rooted. Briefly, the dilemmas are defined as follows:

- **Pioneer's dilemma:** if the startup launches too early, it will pay the pioneer's cost and is likely to fail due to insufficient resources; if it launches too late, it is unable to capture users from incumbents.
- **Cold start dilemma:** without content, users are unwilling to join and generate content.
- **Lonely user dilemma:** without other users available at a given time, users are unable to use the platform.
- **Monetization dilemma:** if access and usage of a platform is provided for a fee, users are unwilling to join; if access and usage is free, the platform is economically non-viable.
- **Remora's curse:** if users or content is sourced from a host platform, the cold start problem can be solved; however, at the loss of power relating to customer relationships, monetization, and so on.
- **Pivot dilemma:** if the startup accommodates its user's wishes in product development, it loses focus; if it does not, it loses the user.
- **Peter Pan's dilemma:** if the startup accepts external funding, it loses decisive authority and becomes vulnerable to hasty decisions; if it does not, it loses against competitors with funding.
- **Juggernaut dilemma:** due to lack of legitimacy, the startup is unable to convert enterprise clients which would grant it legitimacy.

Following earlier research outlining failure as a combination of reasons (Lussier 1996), it can be stated that the failure of the sampled startups comprises 1) general business problems (e.g., management issues; lack of marketing), 2) startup-related problems, arising from the fact of being a startup (e.g., "liability of newness"), and 3) platform-specific problems.

"Illusions", which were mentioned by some founders, are perceived as fallacies and observed also potentially to exist in other cases. It was also found that founders typically associated biases (i.e., their own thinking errors) as reasons for why they could not properly address the dilemmas, or even identify them in time. They are perceived to relate to dilemmas because they affect the assumptions of strategic decision-making. For example, assuming that all users prefer freeness over quality will more likely lead to a monetization dilemma than a contrary premise.

The identified fallacies are defined as follows:

- **Illusion of scale:** the tendency of startup founders to assume online businesses require less effort to succeed than offline businesses.
- **Illusion of free:** the non-validated assumption that users are unwilling to pay for online products.
- **Technology bias:** the tendency of startup founders to assume that all startup problems can be solved by technological means.
- **Build it and they will come:** the tendency of startup founders to assume that the product will market itself.
- **Dog food blindness:** the refusal of accepting fault in one's product.
- **Sunk code fallacy:** the tendency of startup founders to refuse to make drastic business changes (i.e., pivots) due to the time and effort spent making the current version of the product.
- **Reference point bias:** the tendency of startup founders to assume that successful implementation of a particular strategy or tactic in another context would automatically work in their context (e.g., "because it works for x, it will work for us").

Due to limitations on the scope of this study, fallacies were left for further research. It was considered that including them would 1) take away the focus of dilemmas, and 2) expand the required theoretical basis to become too extensive for one study. In other words, to maintain depth of the analysis, it was not perceived possible to thoroughly discuss dilemmas and biases, and so the latter are only briefly discussed as preliminary observations.

Further clarification in the next section will explain why a subset of problems was chosen for detailed treatment. Consistent with GT principles (Glaser 2004), all dilemmas and illusions were captured by the author. Particular names, including "remora", "cold start", "dog food", "build it and they will come", and "sunk code" were taken from founders' post-mortems and industry terminology.

4.3.2 Narrowing the focus of the study

As can be seen, the GT analysis identified many phenomena that remain outside this report. All research can be regarded as a tradeoff leading to the necessity of restraining the research focus (Eisenhardt & Graebner 2007), and focusing on dilemmas was simply the author's choice. The author preferred a deeper focus on dilemmas, albeit this decision omitting the treatment of biases that, according to the analysis, are equally important when considering the failure outcome.

The analysis showed that platform *startups* struggle with many other problems relating to their startup nature (e.g., Wasserman 2013). However, given its positioning, this study focuses on platform-specific problems. Most other startup problems are well documented in the literature. For example, liability of newness (Bruderl & Schussler 1990; Freeman, Carroll, & Hannan 1983; Singh, Tucker, & House 1986; Stinchcombe 1965) is associated with the problem of legitimacy (i.e., "Juggernaut dilemma"). The entrepreneurship literature has analyzed problems of adaptation and related *turnaround strategies* (e.g., Boyle & Desai 1991; Hofer 1980; Melin 1985).

In a similar vein, the strategic management literature has identified glitches between venture capitalists and founders. Also, growth pains such as the *cash flow problem*[71] (Mears 1966; Wilcox 1971) are associated with Peter Pan's dilemma. Katila, Rosenberger, and Eisenhardt (1998) studied the "shark's dilemma"; that is, how a startup can collaborate with a larger organization while retaining its competitive advantage. Pioneer's advantages and disadvantages, and also those of early movers, have been extensively covered in the literature (e.g., Agarwal & Gort 2001; Golder & Tellis 1993; Kerin, Varadarajan, & Peterson 1992; Lieberman & Montgomery 1988; Robinson, Fornell, & Sullivan 1992).

The following table classifies the strategic dilemmas based on their applicability.

Table 10 Analysis of dilemmas

Dilemma	**Specific to platform startups**	**Specific to startups**	**Specific to online business**	**Applies to any business**
Cold start	x			
Lonely user	x			
Monetization	x		x	
Remora's	x			
Pivot				x
Peter Pan's		x		
Pioneer's		x		
Juggernaut		x		

The cold start dilemma can be regarded as a specific problem for platforms, regardless of whether they are online or offline (see Chapter 4.4). The lonely user dilemma relates not only to activating users, but also to time[72]; thus, it is a problem of real-time social services. Monetization is a general problem of

[71] The cost of customer acquisition needs to be covered instantly, while customer lifetime revenue is received in the future. Therefore, the faster the company grows, the more it accumulates loss.

[72] Finding available matches at any given time complicates coordination, and thus aggravates the chicken-and-egg problem.

online offerings, and also applies to platforms, although not necessarily to all startups beyond Internet markets. Remora's curse applies when the platform startup employs the remora strategy to obtain users or content from another platform. The pivot dilemma[73] applies to all businesses, but is not a specific problem of platform startups. Peter Pan's dilemma is a problem for startups that need to decide whether to remain small and be consumed by competition, or grow big and be consumed by expenses. The pioneer's dilemma relates to launching an unfinished product and failing to gain adoption, or waiting for it to be perfected and losing competitive advantage. Similarly, the juggernaut dilemma is proprietary to startups: they cannot get customers due to a lack of legitimacy, and due to lack of customers, they cannot get legitimacy (cf. Stinchcombe 1965).

Detailed treatises on all dilemmas, although enticing, would have severely fragmented the study as they clearly connect with multiple streams of the literature. In other words, breadth was sacrificed for depth. This decision was reinforced by the fact that it proved difficult to find a common denominator that would have enabled building a unified theoretical framework, as now has been achieved by relying on the platform literature. Finally, due to the relative recency of the platform/two-sided markets literature, it was concluded that there is more room for contribution than other identified streams, especially on the strategic management of platforms.

4.3.3 Chosen dilemmas and their treatment

Following the aforementioned rationale, the focus of this study is on strategic problems proprietary to platform startups on the Internet, particularly on the following dilemmas:

- Cold start dilemma
- Lonely user dilemma
- Monetization dilemma
- Remora's curse.

These dilemmas will be discussed in detail in the following sections, while other dilemmas are omitted. The presentation of dilemmas follows the structure of: 1) definition and exhibits, 2) the literature positioning of the dilemma, and 3) solutions derived from theory. *Solution* is intuitively defined as a

[73] If a startup heeds customer feedback when developing a product, it loses its *raison d'être,* or its original vision; if it ignores customer feedback, it loses the customers.

solution to a problem that, in this case, satisfactorily solves one or both parts of the dilemma.

It is argued that by solving the cold start dilemma through subsidization (e.g., offering free access and usage), the startup will face the monetization dilemma, whereby it is unable to capture economic value from the interaction taking place in the platform. Whereas, when solving the lonely user dilemma by applying the remora model (i.e., 'envelopment' in the platform literature), the startup faces what is termed 'remora's curse' (i.e., dependence of the host platform). The latter condition bears similarity to the classic hold-up problem, which is explained in Subchapter 4.7.2. Cold start and lonely user dilemmas are understood as different realizations of the chicken-and-egg problem presented in the dissertation's introductory chapter.

The following figure illustrates the idea.

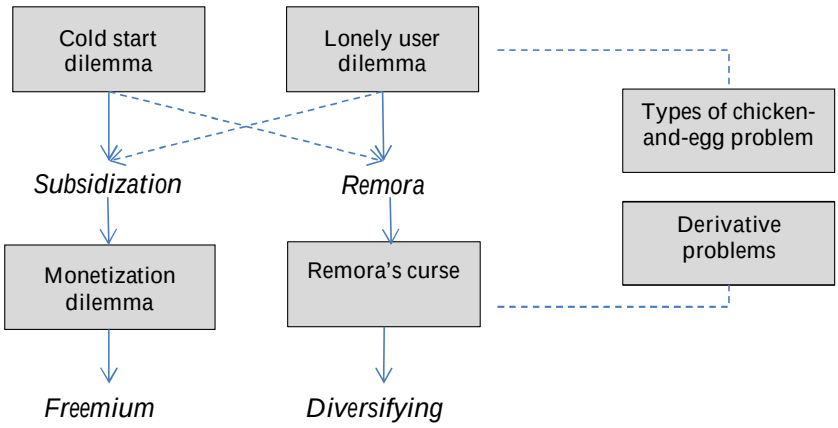

Figure 11 Strategic actions and their consequences

Therefore, the following strategic decisions apply:

1. When facing the cold start dilemma, the startup solves it by *subsidization* or remora.
2. When facing the lonely user dilemma, the startup solves it with the *remora model* or subsidization.
3. When facing the monetization dilemma, the startup solves it with the *freemium model.*
4. When facing remora's curse, the startup solves it by *diversifying*.

The selection of solutions arises from the literature and analysis of the empirical material. Subsidization is commonly considered a solution to the cold

start problem in the platform literature (e.g., Rochet & Tirole 2005), while the remora model is conceptually similar to the envelopment strategy presented by Eisenmann et al. (2011). Freemium, however, is a special form of subsidization that is commonly applied by Web startups (Wilson 2006; Niculescu & Wu 2013). Notice that subsidization and the remora model can both be applied in relation to the cold start and lonely user dilemmas. In the following subchapters, this particular order has been chosen for the purpose of presentation, that is, not to repeat their treatment.

Diversifying is synonymous to multihoming, which is a central concept in platform theory (Armstrong 2006). Also, because there is generally a high degree of interoperability between Web platforms, for example, through application programming interfaces, or APIs (see Rochet & Tirole 2003), both envelopment and multihoming are common in online markets (Mital & Sarkar 2011). Therefore, the considered solutions depict both platform theory and practice. However, they have not been integrated into one framework in the extant literature.

4.4 Cold start dilemma

4.4.1 Definition and exhibits

The cold start dilemma is a specific problem for content platform startups relying on UG. The dilemma can be defined as follows: when there is a lack of existing content, no users are motivated to create new content, and so there remains a lack of content. As a result, the ideal UG model fails, the platform will fail, and the startup will fail. These assumptions will be examined next. First, it is assumed that existing content has a relationship with new content; that is, the reason why other content is created. Note that the content also involves externalities that are not other content, such as sharing and ‘liking’. These spillover effects will be discussed in Subchapter 4.4.2.

Second, the cold start dilemma might differ through the assumption of multi-sidedness, depending on whether or not user homogeneity is assumed: 1) in a one-sided content platform, users provide content that is beneficial for the same type of users, and 2) in a two-sided content platform, users provide content that is beneficial for other types of user. The interaction between user groups defines the type of the platform, which is logically derived from the fact that users’ interests vary: for example, buyers seek sellers, not other buyers in an auction platform; males (typically) seek females in a dating site; however, people interested in mobile phones are looking for other people of a similar type in a mobile phone discussion forum. This is relevant due to

motivational factors; namely, creating a community, which will be revisited when discussing solutions. If the interests of the users are common, the platform can be defined as a community, and therefore tactics to acquire users from this particular niche should vary *vis-à-vis* a mass audience.

The question of motives and incentives is paramount for getting the desired response (see Table 11 [2]). Based on the ideal UG model (see Chapter 3.4), the goal is that the content and actions of first-arrived users lead to the recruitment of second-generation users either directly (e.g., invitations) or indirectly (e.g., content indexed by search engines), as opposed to the startup acquiring new users, which requires marketing investments and, potentially, skills (Table 13, [6]). Building such assets can be prevented by the *build it and they will come* fallacy (Table 13, [2]), defined as a tendency of technology-oriented founders to avoid marketing.

There are two types of participation behavior: contribution and consumption[74]. Contribution is feasible if expected benefits are larger than the cost of contribution. Consumption has a lower cost but also a low switching cost due to a generally high number of alternative sources of content (i.e., substitutes) on the Internet. Further, the benefit of consumption arises from the informative or entertainment properties of the content; the supply side benefit comes from search engine externalities, which is compatible with online search behavior (Hsieh-Yee 2001), and also the social spillover effect, such as sharing or commenting on the content. The difference in participating behavior enables analysis of the setting as a two-sided platform, whereas including single-user motivation would result in a one-sided platform.

The analyzed startups report the cold start problem as follows.

[74] Note the similarity to types of monetization behavior: joining without paying (i.e., free users) and paying for joining (i.e., customers).

Table 11 Exhibits of cold start dilemma

	Example
[1]	*"(We) underestimated the "cold start" problem […] especially when it relies on user-generated content. The value you provide to your users centers around the content on the site, so to build a user-base you need a lot of content created by the first users to kick-off the community."* (Dickens 2010).
[2]	*"We fell into the "build it and they will" come school of thought (although even when they came, we still weren't in good shape). Users didn't review because there was no enlightened self-interest for them to do so. Nobody wanted to edit our data for the same reason."* (The Chubby Team 2010).
[5]	*"[A] place where people can find and provide information about private companies/startups, and also review them. Awesome idea, right?! WRONG! Where the heck are we going to get all this data about startups?"* (The Chubby Team 2010).
[6]	*"[H]aving to consistently find new content was probably the biggest hit to my motivation for the site. As much as I loved indie music it was draining to constantly find new albums to post up."* (McGrady 2008).
[7]	*"[The startup] was a product designed to connect journalists with readers. As such, we had two sets of customers, which means we need to do customer development twice. I spent a great deal of time designing the ultimate solution for journalists, and almost no time on what readers wanted. As such, I didn't really know what to make, or what to say to the journalists about what they should write."* (Biggar 2010).
[8]	*"Our proposition was made even more complicated because we were trying to create a market-place. When a magazine opens for submissions, you're submitting to that magazine. But [the startup] was one step removed – anyone could make an assignment. So even if you trusted [us], you didn't necessarily trust the person who posted the assignment."* (Powazek 2008).
[9]	*A close friend reading my early business presentation told me he liked it a lot but was worried about one line. He said it sounded like I'm building infrastructure and that is going to create problems with most investors. At the time I was focused on building a website and the comment didn't register. Now, with more perspective, I can certainly appreciate the advice.* (Hammer 2008).
[10]	*In community-generated media, trust is everything. When you ask for submissions, contributors go through an instant internal calculation: "Do I trust these people with my work?" When your site is brand new, you've got no record to rely on. And with more shady "user-generated content" schemes popping up every day, people have their defenses up.* (Powazek 2008).

As noted, and demonstrated by exhibits, a cold start is a specific problem for Internet startups trying to leverage UGC [1]. Examples include discussion forums, blogs, and various crowdsourcing services, in which the startup offers a platform for discussion or other forms of social interaction; for example, dissemination of information, pictures, videos, or ratings [5][75]. Such startups depend on relevant and updated content (e.g., articles, comments, pictures, reviews, and ratings) to acquire visitors, convert them into repeat users, and encourage them to produce more content[76].

[75] For example, YouTube is a content platform, so is Flickr. Whether they are one-sided or two-sided platforms is arbitrary.

[76] In contrast, in-house content-generation does not require users to actively produce content; albeit, startups following this model might enable UGC, hoping for UG benefits.

Consequently, if there is little or no UGC in the platform, new participants have no or only small incentive to join; if no participants join, no new content is created, and so forth. As no visitors and new content are created, there is no reason for the platform to exist and the startup will fail. In other words, the cold start dilemma is a variation of the well-known chicken-and-egg problem, and quite a typical reason for platform startups to fail.

The cold start dilemma can be demonstrated with a simple game. The following considers a one-sided platform in which users are all the same type, and gain benefit from each other's participation.

Table 12 Too many consumers (of content)

		C_2	
		Contribute	*Not*
C_1	*Contribute*	0, 0	-1, 1
	Not	1, -1	0, 0

In the game, contributing can be unpleasant for consumers of content; thus, they incur a cost (i.e., -1). This cost is a function of time, effort, and uncertainty concerning the usefulness of contributing (see Table 13, [10]). Moreover, if a consumer contributes content, another consumer will not return the favor but simply consumes the content, thus gaining a payoff of +1. If both parties contribute, the effort and benefit cancel each other out. Both receive a payoff of zero. However, this is not stable equilibrium as each party has an incentive to improve his/her position by not contributing (i.e., moving from 0 to +1). Because not contributing yields the same benefit as contributing if the other side makes the same choice, players might be indifferent to contribution. The safest strategy, which minimizes potential cost, known as *minimax* (see Camerer 2003), is not to contribute, as contributing risks a negative payoff.

Therefore, users will not contribute when they expect others not to return the favor. However, more importantly, they might not contribute *especially* when they expect others to contribute.

Now consider changing the game into a two-sided platform, where there are two different groups of users, both of which derive additional benefit from complementing interactions.

Table 13 Consumers and generators

		G: *Contribute*	G: *Consume*
C	*Contribute*	2, -1	0, -1
	Consume	3, 1	0, 0

Generators enjoy contributing (i.e., creating content), although it is more valuable to them when there are consumers of content. In contrast, they are indifferent to consuming content. Consumers of content do not prefer contributing, so it is costly to them: however, they derive benefit from the content produced by generators. This is clearly demonstrated in Table 13, case [7], where the startup focused on one side while neglecting the other; as a consequence, it was unable to provide network effects for either.

Generators receive intrinsic benefit from contributing and are indifferent to other players' contributions, but not consumption. In fact, consuming content is a type of invited free-riding: the creator of the content wishes it to be consumed, and is indifferent to whether others create content or not; although, they might appreciate "side payments" such as praise and criticism. Further, in contrast to the previous example, the payoff for the consumer no longer relates to his/her own choice of contributing and, given he/she has information on the generators' payoffs, the consumer will always prefer not to contribute. A stable equilibrium[77] is when generators contribute and consumers do not.

Furthermore, this explains why merely joining a platform is insufficient in the absence of active usage. The users who join will quickly churn if the platform is "cold". This observation is critical in terms of determining which action to follow: joining or participating[78]. Therefore, it becomes important for the startup to find contributors and offer them a convenient platform. Contributors and consumers can have complementary needs, which is why both parties are needed. Moreover, the startup needs both to consider the critical mass of any users (see Chapter 4.5) and also the correct proportion of participants. This is because, in a two-sided setting, the types are interdependent, and rather than preferring the existence of a similar kind of participant, users prefer a different kind to join.

A two-sided platform, in particular, functions on reciprocal utility: the utility of group *A* for group *B* is in proportion to the utility of group *B* to group *A*

[77] Neither party would gain a better payoff by switching.

[78] As noted by one of the founders (Roseman 2010): *"good Google foo [website traffic] won't save you. You need that traffic to translate into a community. A visit is not an interesting statistic, especially in a business that requires the community to produce content."*

(for details, see Subchapter 4.4.2). The chicken-and-egg dilemma is therefore associated with the quality, amount, and type of activity of respective groups to their counterparts. Advertising is a special variation as there is no content without advertisers[79]; without content, no visitors; and without visitors, no benefit for advertisers. Therefore, although often considered negative network effects *vis-à-vis* end users, advertisers can, in fact, generate indirect utility by funding content creation. However, this does not apply under UG; thus, advertisers are not considered in the dilemma.

Further, a two-sided platform requires strategies for managing both counterparts, whereas a one-sided platform considers the needs of only one set of customers or users (Table 13, [6]). The implication is that the startup needs to consider both sides in its strategies. Finally, although the startup can mediate interaction between two parties, there needs to be a degree of mutual trust for the interaction to take place, as exemplified in Table 13, [8]. This trust might not automatically transfer from the platform to all of its users.

Often, the monetization model for content platforms is indirect due to high competition in most content markets, and also the considerations presented below; thus, the content is provided for free and monetization is achieved by showing advertisements (see monetization dilemma, Chapter 4.6). Note that UG introduces some restrictions to monetization; firms cannot readily charge for amateur content due to uncertain quality, expected unwillingness to pay (refer to Subchapter 4.6.1), and resistance from the users creating the content who might feel that their rights are violated if their content is monetized without revenue sharing. The typical monetization model is therefore indirect: content platforms delegate content creation to users instead of utilizing the firm's own resources, design a process through which the content is re-used to attract new users such as search engines and social sharing functions, and then monetize the content through indirect revenue models, typically advertising.

Due to the problem between UGC and direct monetization, that is, the startup cannot directly monetize the free content provided by users without consumers' retaliatory effects (i.e., churn), and by providers of the content (i.e., resistance to charge for their input), the strategies for monetization remain limited. In fact, even after solving the cold start dilemma, a startup needs to solve the monetization dilemma to become what can be termed a viable business. Moreover, platforms dealing with real-time interaction need to consider the lonely user dilemma.

[79] As the firm is unable to provide content without indirect monetization; note there is an inverse proportion to advertising, so that users typically respond negatively to its increment.

Finally, Appendix 2 includes a brief meta-discussion on the definition of cold start; namely, if it can be considered a dilemma based on the definition given here.

4.4.2 The literature

The chicken-and-egg problem of acquiring content, participants, or liquidity[80] is widely recognized in the platform literature, and also the preceding literature on e-marketplaces (see e.g., Caillaud & Jullien 2003; Parker & Van Alstyne 2005; Sun & Tse 2007; Kim & Tse 2011; Raivio & Luukkainen 2011).

In fact, the chicken-and-egg dilemma is an inherent consequence of the two-sided nature of a platform due to the requirement of "getting both sides on board" (Evans 2002), or an "*essential feature of two-sided market analysis*" (Luchetta 2012, 11). Therefore, the phenomenon is not novel; however, relatively little empirical research is focused on its solutions. Furthermore, it is often neglected by economic models that assume simultaneous entry (Hagiu & Spulber 2012), and consider pricing the key strategy for encouraging entry (Piezunka 2011).

The cold start dilemma can be described as a coordination problem, in which either all or no users adopt a platform (Farrell & Klemperer 2007). This is similar to *herd behavior* (see Banerjee 1992) or circular logic, as a user's action depends on that of collective action, and can lead to tipping in an industry-wide setting (see Katz & Shapiro 1994). As a theoretical extreme, it displays how network effects can dominate adoption *if* all other determinants of adoption are ignored. However, it does not apply well to real contexts. Farrell and Klemperer (2007) give an example of a photography market, comprising photographers and film developers who both favor each other, in which they insert more realistic assumptions, so that groups are not making *all-or-nothing* choices; rather, some users might adopt and others not in response to individual preferences and heterogeneity among users, and negative network effects termed *intra-group congestion*.

This network term, congestion, translates into negative network effects in the platform context. Also, Shy (2011) notes that network effects are not always positive, and thus do not always increase willingness to adopt. For example, consider a network in which users are evaluated as being, for instance, "shady" or unreliable. Such a network tends to attract a similar kind of

[80] The term *liquidity* is often employed in the context of e-marketplaces (e.g., Ordanini, Micelli, & Di Maria 2004), and refers to transaction volumes.

participant while high-quality users will refrain from adoption[81]. With regard only to the platform, the perceived quality of participants is likely to play a role of adoption. The startup therefore needs to pay attention to not merely attracting any users but such users who increase the propensity of desired users (i.e., the target market) to join. This granularity is often neglected when discussing "traffic driving" and "community building" as strategies for attracting users. Negative network effects are discussed more thoroughly in Subchapter 4.5.2.

Although the chicken-and-egg problem lacks a substantial amount of empirical work, it has been focused on by some studies; for example, Mas and Radcliffe (2011) studied it in the context of a mobile payment platform in a developing country, Funk (2006) contrasted Japanese and Western efforts in building a mobile Internet, and Raivio and Luukkainen (2011) documented challenges relating to Open Telco, a project inviting mobile carriers to collaborate. Mas and Radcliffe (2011) identify three factors that prevent payment platforms from scaling up: 1) lack of effective network effects, 2) the "subscale trap" (i.e., cold start dilemma), and 3) lack of trust from both parties. They argue (*ibid.*, 305) that

> *"At first, all these elements work against a deployment. The benefit to a customer of joining the system is minimal when few others are connected (network effects) and the merchant network is not sufficiently dense […] to meet their […] needs. Meanwhile, merchants remain reluctant to tie-up scarce working capital […] because they do not yet see enough demand from customers […] And customers lack trust in the system, because they know few people who can vouch for the service."*

The literature refers to a *critical mass* (e.g., Rohlfs 1974; Evans & Schmalensee 2010), which can be defined as the point where the perceived cost of participation is lower than the benefits of participation, and the benefits of generating content are superior to only consuming it (for a more detailed approach to critical mass, see Subchapter 4.5.2). Two points are important relating to the timeliness of a critical mass: 1) user expectations, and 2) competitive dynamics. User expectations are important because if users are presented with a "cold platform" they might quickly notice it to be of no use and

[81] A real example might be *black hat* search engine optimization communities, which basically aim to divert search engine algorithms by applying unethical practices such as link farms. The existence of such communities is strictly a negative externality for honest search-engine optimizers, as the "rotten apples" ruin the reputation of the industry and force search engines to tighten their rules concerning optimization.

never return[82]. The cold start period is formulated by Evans (2009a, 102) as the "ignition phase", in which

> *"[C]ustomers are trying the platform and assessing its value; these early adopters will stop coming back, and stop recommending it to their friends, if the platform does not grow quickly enough."*

This approach would seem to be compatible with the notion of a 'one-shot game', which users either join instantly or not at all, and which, in turn, can become problematic when associated with the "perfect product" fallacy[83]. Essentially, while the beginning of a platform startup is critical, it is questionable whether, for fear of not generating a critical mass, its launch should be delayed or not.

Second, in a competitive setting where rivals compete for the same users, whichever reaches a critical mass first can become the dominant platform. In the case of strong network effects, it is expected that reaching a critical mass will lead to tipping (Shapiro & Varian 1994), in which users of competing platforms switch to the focal platform, and thus the market is what is termed *winner-takes-all* (Sun & Tse 2007). In contrast, the critical mass can be regarded as isolated from competition, when assuming multihoming and less-than-strong network effects, so that internal consistency[84] of the user base is sufficient, regardless of coexisting platforms.

Moreover, trust creates a relationship with the legitimacy of new ventures (Stinchcombe 1965) and the vast body of the literature in which it is discussed (for a review of online context, see Grabner-Kräuter & Kaluscha 2003). Trust is, however, implied in the two-sided markets literature through expectations. An example of negative expectations is given by Galbreth, March, Scudder, and Shor (2003, 316):

> *"If buyers and sellers are skeptical of the prospects of an e-marketplace, these expectations might be lowered [which] could cause participation levels to move toward the empty e-marketplace equilibrium as opposed to the internal one. […] The general lack of confidence in Web-based initiatives in recent years could explain why many e-marketplaces failed to grow to the projected participation levels − when potential participants expect the e-marketplace to fail, it will."*

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[82] A strategy for overcoming this is to avoid a large-scale launch (i.e., *marketing launch*) prior to reaching a critical mass (see Chapter 4.8).

[83] A tendency to delay launch until the product is ready. See Appendix 3 for comparison between late and early launch.

[84] Internal consistency refers to the possibility of a user finding a match with a relative ease.

In fact, expectations are in the nature of the dilemma; if expected adoption is low, then it remains low and the expectation becomes a self-fulfilling prophecy (Shy 2011). In contrast, if the platform gains more powerful advocates, expectations are higher and the prophecy takes a positive direction, even hype. The case of hype was present in the earlier stage of online platforms, namely the dotcom era. Evans (2009a) argues that the failure of dotcom platforms was due to three reasons: 1) existing bilateral relationships and other offline arrangements "got the job done", so there was no need for online platforms; 2) participants perceived that e-marketplaces aimed to depreciate their value. Thus, they mainly focused on price competition between participants, which dilutes brand and services; and 3) lack of liquidity. Due to the fact that sellers were skeptical about joining, buyers lost interest, and there was no reason for the platforms to exist[85].

Rohlfs (1974) and Funk (2006) refer to the cold start dilemma as a *startup problem*[86] and associate it with direct or indirect network effects. Funk (2006) studied how Japanese firms were able to overcome this problem when introducing a mobile internet, whereas Western companies failed to do so, and discovered that this was due to 1) generating entertainment content by smart partnering, and 2) offering the content via a micro-payment system in which fees were collected and redistributed through a standard system. Evans (2009a, 102) associates this with a critical mass by stating that "*[t]he challenge that catalyst entrepreneurs face is how to achieve the critical mass necessary for ignition […] over some reasonable space of time*." This thought will be revisited in Chapter 4.8.

Schilling (2009, 195) notes that "*if the user must invest considerable effort in learning to use a computer platform, he/she will probably choose to invest this effort in learning the format they believe will be most widely used*." This approach, again, highlights the importance of network effects in creating platform pull. Furthermore, it links the cold start problem to adoption barriers. Adoption of technology, or 'technology acceptance', has been widely studied within information systems science (for a literature survey, see e.g., Mäntymäki 2011) and especially by economists who consider benefits versus costs; ultimately, leading to preference concerning the platforms as not all of them can be adopted. Their adoption costs can include psychological resistance, time, and effort, which might be crucial for some users, even to the extent that time is scarcer than money. Some startups highlighting free models as the primary motive for adoption might apply a sub-optimal pricing strategy, which will be discussed in Chapter 4.6.

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85 This analogy to dotcoms, ten or so years later, will be revisited in Chapter 4.6.

86 Rohlfs (1974, 18): *"how to attain such a user set, starting from a small or null initial user set."*

Both the number of participants *per se* and their proportion need to be considered. This is especially important for match-making platforms such as dating services. An example relating to content platforms, in which the reasons for participation relate to information goals, might be a knowledge-sharing platform, here a sub-type of a content platform, in which there needs to be the correct proportion of questions and answers (Kim & Tse 2011), and providers of both to guarantee a sustaining process of UG. Similarly, an exchange platform needs to make sure there are sufficient buyers to interest sellers and *vice versa* (Teece 2010). Therefore, even regarding content, and not only social connections, the startup faces coordination issues of a match-making type.

Rationality of adoption does not only reflect the current situation (i.e., weighing costs and benefits as they are), but also the future prospects of the platform; namely risk and uncertainty. Katz and Shapiro (1986, 824) formulate this position as follows:

> *"[I]n the presence of network externalities, a consumer in the market today also cares about the future success of competing products.[…] total benefits derived from it will depend, in part, on the number of consumers who adopt compatible products in the future."*

This is also asserted by Köster (1999) who asserts that adoption depends on both historical interactions (i.e., existing base of content or users) and expected interaction (i.e., expected bases). Although both Katz and Shapiro's (1986) and Köster's (1999) definitions referred to other complementary durable goods, digital content is compatible with the implications; essentially, lifetime projections and long-term survival of the chosen platform are likely to influence the contribution decision. Equally, the demand-side will find this important, as finding a reliable source of content reduces search costs (e.g., time spent employing search engines).

Another point to note from Katz and Shapiro's (1986) quotation is *technology-specificity*, which is rooted in the notion of asset specificity (Riordan & Williamson 1985). Specificities might have weight in the adoption decision; for example, as many startups eventually fail (Haltiwanger et al 2009), users might experience greater than normal doubts concerning contributing to or joining them, given they are aware of failure rates. In the case of demise, a user loses the time and effort invested in learning a new system (i.e., the learning curve is a platform-specific investment), incurs search costs for finding a replacement, and might experience loss of private data in some cases[87].

[87] Although the author must note that all failed startups observed during the research period provided a decent export function prior to closing down, this seems to be the industry standard for a 'graceful exit'.

Finally, the user might not only take a passive stance in evaluating the risk of platform demise, but might take action to influence it; thus showing support, although based on the notion of improving his/her own gain. Due to awareness of inter-platform competition, the propensity of user recommendations, also termed peer marketing, viral marketing, or simply word-of-mouth, can actually increase, thus enabling the startup to reach the ideal user-generated customer acquisition. As put by Katz and Shapiro (1986, 831), "*given the network externalities, each consumer wants all other consumers to purchase his favored technology*." Therefore, in theory, network effects can encourage a user to promote the platform to his/her peers; the more who join, the more useful it also becomes for him/her.

As established, the market does not exist if the chicken-and-egg problem remains unsolved, as there is no reason for either party to interact (Evans 2002). Moreover, the adoption by one group triggers a cascading growth as the benefits of adding a new member come both from that new member and the influence this member has on attracting more members. Evans (2002, 76) notes that "*[i]f we assumed the base of sellers were important to attracting buyers, (and vice versa), the indirect benefits would be even greater because a buyer joining the system would induce additional sellers to join (and so on), which would generate additional indirect benefits on both the seller and buyer sides.*" Hence, we are close to the definition of *viral growth* (e.g., Salminen & Hytönen 2012), which is essentially exponential growth due to one member inviting more than one new member, and so on[88].

Note that if we do not assume two-sidedness (i.e., distinct user groups) and network effects (i.e., interdependent interaction), the cold start problem would not be compatible with the chicken-and-egg problem in the literature. This is because, if the content platform is a one-sided market, the platform owner (i.e., startup) might simply provide the content, as is done by media broadcaster and news websites, among other content portals, and there would be no cold start problem. This would render the study's treatment a trivial exercise. To counter this, we can distinguish 1) two distinct user groups (i.e., consumers and contributors of content) and also 2) interdependence (i.e., network effect) between them, which is mediated by UG, so that the consumers derive benefit from the content produced by contributors.

Whether contributors derive benefit from the presence of consumers is arguable; it is possible that the nature of this benefit is intrinsic motivation, *desire to create*, or some form of altruism. The motives to contribute to platform

[88] The simplest definition for viral growth is $x*y > 1$, where x describes the number of users invited (by base user) and y the number of accepting users who join (Salminen & Hytönen 2012). When all users successfully invite more than one new member, the growth is viral.

development have been studied, in particular, relating to open-source platforms: Schilling (2009, 202) asserts that "*in the software industry, individual programmers may work on an open-source software program because it results in solutions to their own problems, provides an opportunity to interact with peers and improves their reputation as experienced programmers*." Similar, but varied, motives can be found in the UG context, although more research is needed. There is an emerging body of the literature relating to the motives of the crowd which comes close to this purpose; for example, Dow et al. (2011), Kittur et al. (2013), Pitkänen and Salminen (2012), Zhao and Zhu (2012), Zheng, Li, and Hou (2011). Drawing from this literature would open opportunities in utilizing crowds to solve the cold start dilemma.

4.4.3 Solution: Subsidies

Subsidization is the most commonly considered solution in the platform literature. By definition, a side is subsidized "*when the price it faces is lower than the price it would face in an independent market*" (Bakos & Katsamakas 2008, 173). In the lonely user dilemma, to increase possibilities for interaction, the startup might subsidize one of the user sets for joining. With regard to the cold start dilemma, the startup might subsidize contributors of content in exchange for their efforts, or developers for creating extensions or content creation tools. Because developers or other contributors might require payment in exchange for their contribution, subsidies can also include negative prices (Parker & Van Alstyne 2005).

For example, Evans (2002) argues that "*providing low prices or transfers to one side of the market helps the platform solve the chicken-and-egg problem by encouraging the benefited group's participation – which in turn, due to network effects, encourages the non-benefited group's participation.*" In a similar vein, Spulber (2010, 7) argues that "*incentives induce strategic participation which resolves the cross-market coordination problem.*" Free offerings are not a new invention. Rohlfs (1974, 33) had already proposed that "*[t]he most direct approach is to give the service free to a selected group of people for a limited time*." Rohlfs (*ibid.*, 33) further argues that the initial user base must be sufficiently large to achieve a critical mass, and notes that "*half measures are worse than useless*", because demand will be zero without a critical mass of users. This feature, stemming from network theory, has been adopted by the platform literature, so that "*[a]n important characteristic of multisided markets is that the demand on each side vanishes if there is no demand on the others, regardless of what the price is*" (Evans, Hagiu, & Schmalensee 2006).

Although Piezunka (2011) specifies that the platform owner might not give negative prices because of a potential moral hazard problem (Gawer & Henderson 2007), negative prices have been observed, for example, by Parker and Van Alstyne (2005), and cited by Mas and Radcliffe (2011) as a strategy utilized by Paypal. Mas and Radcliffe (2011) argue that negative prices (i.e., paying for users to join) helped PayPal achieve a critical mass faster than would have been enabled only by zero prices. Other startups have applied recommendation fees to incentivize their users to promote the service to their peers (Libai, Biyalogorsky, & Gerstner 2003). However, this can be defined as marketing rather than subsidization, which aims to get users to adopt the service by not charging them for its use[89] (Lyons, Messinger, Niu, & Stroulia 2012). Free or negative pricing is possible, although with the precisely identified threat of spamming.

Moreover, the startup might begin by subsidizing one side and, when it is secured, then moving the subsidization to the other side. The goal is to reach a state in which no subsidy is needed as the platform has become self-sustaining. Caillaud and Jullien (2003) refer to this strategy as *divide-and-conquer*, by which the market is divided into two markets (i.e., two-sided markets) with one being captured by subsidization, after which the other side will follow, enticed by network effects. However, subsidization might become a permanent strategic choice to maximize participation in a two-sided market (Rochet & Tirole 2003). In the context of online startups, subsidization refers to free models in which the users, or a segment of them, are not charged. Complete free offerings, or non-paid access and usage of the platform, are referred to as *freefying*, whereas offering a free version and a paid version between which the users can move (i.e., convert or downgrade) is termed freemium (see Chapter 1.5).

Consider basic subsidization. In a sequential form, the startup subsidizes one party who is more unwilling to join; after securing participation, the other side can be acquired, for example, through online marketing. Subsidies are, for example, offering free trial (i.e., direct monetization) and free premium membership (i.e., mixed monetization). The problems of freefying are discussed elsewhere (see Chapter 4.6). However, essentially, freefying does not eliminate the cost of adoption although it eliminates the economic part of it; neither is it an effective competitive strategy, as it is easy to copy and can advocate unwillingness to pay. Freefying also creates the monetization dilemma when the startup is unable to capture economic value from its user base.

[89] A more advanced form is a dual-sided referral incentive; for example, Dropbox offers additional storage space for *both* the referred and referring user.

Table 14 Basic solution of subsidization

		side A	
		Not willing	*Willing*
side B	*Not willing*	Subsidize	DN*
	Willing	DN*	DN*

*Do nothing

The startup only needs to subsidize when either party, or both, are unwilling to join. For example, if A is willing to join and B is not, the strategy is to subsidize B and do nothing with A. If both are willing, the startup does not need to give subsidies, which would indicate very strong demand for the platform. If both are unwilling, the startup needs to subsidize both, which would indicate either low demand or high competition.

However, complications arise: what should be done when both parties refuse to join, and the subsidized price is *already* set at zero? Such is the case with free models[90]. In this case, as proven with our sample, a potential fallback is failure, or otherwise applying alternative solutions to solve the dilemma. A third option might be to set a negative price, and pay users to register, although this strategy would be poor for many reasons. For example, the quality of entrants might be low, the costs of adding users grow linearly, and the problem of active use impacted by users not joining due to intrinsic motivation[91].

Moreover, subsidization can quickly become too costly if the market is large, as it typically is in online consumer markets[92]. Belleflamme and Toulemonde (2004) show that even in B2B markets with a limited number of participants, a platform subsidy can make the platform unprofitable to a severe degree, which is due to its linear property: each member needs to be subsidized to the same extent. Therefore, the solution would be to subsidize until a critical mass is reached (e.g., by covering this as a form of marketing expense) and then allow UG to take over user acquisition, as per the ideal UG model. Another solution would be discriminant subsidies in which the amount of subsidy varies based on the expected utility of the user, (i.e., to other users in a single-market platform and to the other side of the market in a two-sided

[90] Free models refer to free access and usage (i.e., freefying) and the freemium model.

[91] Clearly, the cost of adding users is negative, even without including potential subsidies, when having considered user acquisition costs, such as advertising and other marketing costs. Therefore, negative price attached with indirect monetization (i.e., free users) and marketing costs can quite easily be detrimental from a financial perspective.

[92] Consider that the total cost of subsidies, c, would be dependent on a fixed cost x (per user) that would grow exponentially by factor a alongside exponential growth of user base y (subject to a), so that $c = (xy)^a$. Hence, exponential growth would lead to an exponential cost of subsidization.

platform); in other words, paying some users more to join. However, this would raise questions of fairness and might be counter-productive.

The question of subsidies can also be turned around by considering the prospective members' perspective; perhaps opinion leaders could be recruited by offering them other types of incentive, for example, of a social nature. Eventually, the tactics might vary but the principle remains: members who produce the most content are more valuable in content platform, and members who are socially connected and willing to propagate other users to join are valuable to the social platform[93]. Moreover, the user is not necessarily acting in accordance with economic rationality principles when creating content or joining a platform; even an exchange platform can involve social motives for participation. Alas, the type of utility they seek might be more fragmented and heterogeneous than generally understood by startups or platform theory. Tapping into social motives might, in these cases, provide gains that exceed the effect of financial incentives or cost savings.

Furthermore, moving from free to paid products can become problematic. As noted by Brunn, Jensen, and Skovgaard (2002), penetration pricing is a common tactic in one-sided markets, although it can have an effect on long-term profitability. Introducing fees (i.e., 'bait and switch'), if the form of subsidization is freefying, can be difficult as parties rebel against going from "free to fee" (Teece 2010). The early platform literature established that the platform sponsor (i.e., platform owner) actively promotes the platform, not only by subsidizing the cost of its adoption. For example, Katz and Shapiro (1986, 822) define a platform sponsor as one who "*is willing to make investments to promote it*". Further, they argue that when two rival technologies exist, if one is promoted and the other is not, the promoted one can rank higher in adoption, regardless of whether it is superior[94] in some objective comparison (e.g., features). Therefore, subsidization alone cannot be regarded as the optimal solution for the cold start dilemma as factors other than price of usage influence adoption. Further, the cost of subsidization might be lost due to rivals competitively reducing their rates.

Moreover, there is the question concerning *which side to subsidize?* First, Belleflame and Toulemonde (2004, 6) argue that "*in several categories of two-sided markets, most agents of one side of the market arrive before most agents of the other side*." Hagiu (2006, 721) points out that "*in the software and videogame markets, most application developers join platforms (operating systems and game consoles) before most users do.*" In social platforms, the order of

[93] The conclusion, therefore, matches that drawn by Li and Penard (2013), in that quality can replace quantity in the early stage of a platform.

[94] This was the case in the early 2000s when Sega first launched its Dreamcast console, but players hesitated to adopt it due to Sony's clever promotion of the soon-to-be-launched Playstation 2.

entry does not seem to be relevant. However, if this division is assumed, content creators in content platforms need to arrive first as content must logically exceed its benefits. In general, the side that derives *less* benefit from participation should be subsidized (Curchod & Neysen 2009) as the risk of non-adoption is assumed greater. However, Parker and Van Alstyne (2005, 1503) assert that either both sides can be the target in the context of free distribution, or the side that "*contributes more to demand for its complement is the market to provide with a free good*" when network effects are high. This notion does not consider the risk of adoption but rather the benefit for profit maximization.

Second, some users are more valuable than others, in terms of their network utility. The two-sided literature terms these *marquee customers* (Rochet and Tirole 2003), while in the social networking literature, prominent users are termed prestige nodes (Evans 2009a); and in marketing such terms as influencers (Gillin 2009), early adopters (Rogers 1995), or opinion leaders (Flynn, Goldsmith, & Eastman 1996) are employed; that is, users with whom many people want to connect. These users influence others to join the platform.

Therefore, influencers generate significant direct or indirect network effects; thus, it pays to subsidize their entry (Niculescu & Wu 2013). Therefore, platforms need to identify and recruit influencers early on both sides. Finally, Parker and Van Alstyne (2005) assert that the structure of subsidies depends on the industry. They give some examples (*ibid.*, 1496), for example video streaming services and advertising, in which subsidizing consumers is an industry norm; and operating systems and videogames, in which the developers are subsidized while consumers are paying. Therefore, there might be no universal solution to which party receives subsidies, as industry conventions need to be taken into account.

4.4.4 Discussion

Subsidization can solve the cold startup problem under some circumstances, but only as a local solution; there is the *free beer effect* based on which giving a free platform is not viable business unless it is successfully monetized. Price is not the only matter influencing adoption although it will necessarily limit the scope of price-related strategies; therefore, even negative pricing might not be sufficient to solve the cold start dilemma. Subsidization might also lead to a free-rider problem if the product is structured to enable both free and paid usage (e.g., freemium). This takes place by assuming *satisficing* behavior (Simon 1956) and positive willingness to pay. The user is then able to receive benefit from the platform without economic cost, while the startup incurs a

freefying loss, given that there are users who would have been willing to pay if no free option was presented. Startups opting for freefying thus perceive the risk of adoption as greater than the risk of deferred monetization, potentially by an indirect monetization model[95].

Consider that the startup is aware of the cold start problem, which, at least intuitively, it is in most cases. To kick-start the content platform, it produces some initial content in the hope of initiating the user discovery process that will lead to users finding, reacting to, and sharing content forward, thereby recruiting new users. However, if this strategy fails, and the crowds fail to materialize, the startup will find that it needs more content or that a type of pivot is required.

However, if its in-house resources do not scale to match content production or, perhaps, it lacks specific expertise for content production, it might consider UG, representing a "magic bullet", the solution to the content problem. However, this study has already established that UG is not a solution to the cold start problem (Table 11), but rather the consequence of a need or interest. Therefore, given that the root cause lies elsewhere, the cold start problem is not resolved, and the startup returns to the beginning.

It is therefore crucial that a startup recognizes the limits of in-house content generation, unless its deliberate purpose is to develop a content-production organization, which is a strategy sometimes termed 'inbound marketing'[96]. In a business model reliant on UG, however, in-house content provision cannot easily extend beyond kick-off due to its costliness; in fact, in the long run, it would dissolve the benefits of UG if the content community was not be self-sustained. For leveraging the potential of Internet users in terms of content, UG is simply superior to any alternatives[97], which are aggregation and what Mark Zuckerberg terms *frictionless sharing* (Darwell 2013), a concept referring to automated sharing of activities conducted online. At the time of writing, this approach is in its infancy and facing major resistance regarding privacy issues.

The route to a solution can, in fact, arise from the fact that not only existing content, or users, make up for the decision to contribute, or join, but that *expectations* of future interactions can attract users to perform first interactions with the platform. This abstracts the requirement of network effects from quantity or quality to a signaling problem, essentially an issue of marketing communications. If the startup is able to communicate the vision of the

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95 This is commonly known as "searching for a business model".

96 The cold start dilemma does not concern a firm that employs in-house content generation, because it will start deterministically producing content from the beginning. Its challenges relate more strongly to traffic generation and marketing, both being closely associated in online marketing.

97 Consider replacing all user-generated content in Facebook with editorial content.

platform in a credible fashion to, for example, early adopters or "influencers" and employ this communication to commit them to performing first interactions with the platform, in this case creating content, the cold start dilemma is in theory solved. However, user acquisition that relies on content, as in the ideal UG model, is a major problem, which is why credible signaling without first-interaction commitment would be fruitless. Thus, a positive expectation is preceded by awareness, generated by some form of marketing:

Sequence: marketing actions → awareness → positive (or negative) expectation → adoption (or non-adoption)

In some sense, it would be sensible for the startup to find a mixed solution in terms of one that is pure. For example, hiring an in-house community manager to coordinate content generation with partners and ensure initial attempts to achieve a critical mass are successful. Further, the process of content dissemination needs to be well considered, so that 1) the startup has ready access to social media platforms where it can disseminate the content, referred to as an 'integrated marketing communications strategy' (see Mangold & Faulds 2009), and 2) that the website is optimized for participation and sharing to be as frictionless as possible. However, at the same time, founders need to acknowledge that technically frictionless does not imply *socially* frictionless sharing. Ries (2011) argues that users might assume a social risk related to sharing their behavior, and therefore the expected propensity to share does not necessarily materialize.

In theory, the cold start dilemma can be solved by integration into an existing platform that supplies the much needed users who will generate content. However, there can be 1) strong intra-platform competition and 2) misalignment of goals between the startup and platform owner, which result in remora's curse (Chapter 4.7). Equally, in theory, freefying will remove the obstacle of purchasing as it sets the price at zero. However, it ignores the fact that the cost of adoption not only includes a financial cost but also the time and effort of learning a new product (i.e., changing behavior). In addition, when the solution is effective and new users join, the startup faces the problem of monetizing the user base. Once free, it is hard to revert to offering paid products without a considerable churn in the user base. As argued throughout the study, users are not synonymous with customers. This conundrum is discussed in Chapter 4.6.

A horizontal strategy would be to increase the scope of topics (i.e., economies of scope) to drive adoption. A vertical strategy would be to find opportunity niches; that is, unserved content areas, unserved social niches, or buyers and sellers not being adequately served. Finally, differentiation in terms of

features (in simple terms: better execution) can perform an opportunity to grab customers despite network effects, which is often put forward as the reason for both Google's and Facebook's success, whereby they both provided better solutions in comparison to alternatives with a critical mass, including Yahoo and MySpace, both of which are slower and more complex. Thus, in a structural sense, there are likely to be aspects that are impossible to account for in the design of a platform such as execution and features, which can have a stronger influence than network effects[98]. These can either work in favor of or against the incumbent, depending on whether it has a better product or not. More research is needed, however, on the critical success factors of competing platforms' execution strategies.

It has been discovered that successful adoption addresses overcoming change resistance relating to routines (Oreg 2003), and that time and effort are comparable to financial cost (i.e., money) as factors determining the outcome (Webster 1969). Although the removal of financial cost through freefying can, in an economic sense, reduce the overall cost of adoption, it cannot be removed as time and effort lead to the necessary existence of a *learning curve* (Yelle 1979) that, as stated, is a factor of adoption. This is the reason why the cold start problem, interpreted as a problem of adoption, cannot be solved by freefying alone. Even if the subsequent monetization problem were solved, the adoption problem would potentially return to haunt the startup. Finally, the potential discrepancy in perception is crucial as it explains why startups perceive freefying as an answer to cold start problems, which is a logical conclusion assuming that the adoption cost only includes financial cost, whereas users would, in reality, require assistance to decrease the learning curve. Clearly, from an economic perspective, the learning curve can be increased if expected benefits are high. Unfortunately, not all startups create products for such a need that a user is willing to spend considerable time and effort on learning their systems.

The introduction of negative network externalities that increase with harmful activity is a potential risk. In a two-sided market with indirect monetization, Internet startups often resort to advertising as their monetization model. However, advertising typically represents a negative indirect network effect for end users, which is a manifestation of the "cat and mouse" game between advertisers and consumers because the latter desire to escape the former. In contrast, in a one-sided setting, spam and fake profiles result in direct negative externalities for both parties.

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[98] As expounded by one of the founders (Dickens 2010): *"We were offering information on great albums and community voting. But other sites like Last.fm and Hype Machine were offering the actual music. That was a competitive advantage that's hard to beat, and we lacked a significant user base to convince enough people."*

4.5 Lonely user dilemma

4.5.1 Definition and exhibits

Generally, for users to join a social platform, they expect to find other individuals using it. If none can be found, there is little or no incentive to join the platform. The logic is equivalent to the cold start dilemma. In contrast, once the first generation of users have signed up, new users are enticed to join through the connections of the first group, and so on; startup founders refer to the *viral effect* or simply exponential growth. The logic is based on the notion that the total benefit generated by a social platform can be measured through the number of connections between users (cf. Metcalfe's law; see Briscoe, Odlyzko, & Tilly 2006), and the frequency and quality of activity within these connections (i.e., the network effects).

The principle of users' mutual expectations can be demonstrated with a simple game.

Table 15 Startup platform

		S_2	
		Join	*Not*
S_1	*Join*	S^2, S^2	-1, 0
	Not	0, -1	0, 0

S^2 is the potential number of interactions between members of the platform, and marks the network effect. Albeit being a bad proxy for network value (see Subchapter 4.5.2), it is easy to quantify and represents an upper limit for interactions (Aggarwal & Yu 2012). In other words, parties potentially draw symmetric benefit from each other's presence, and payoffs are equal.

Joining has a cost, if not financial then time and effort, which is why expected non-participation of another party leads to both not joining. Both parties would be advantaged by joining but as it is risky for each of them to do so, the outcome might be both not joining. This is referred to as the coordination problem in game theory (Van Huyck, Battalio, & Beil 1990), and describes well the lack of legitimacy to which the new platform is subject.

In contrast, consider an incumbent platform. This example demonstrates the importance of a critical mass.

Table 16 Incumbent platform (with a critical mass)

		S_2: *Join*	S_2: *Not*
S_1	*Join*	S^2, S^2	S^2-1, -1
	Not	-1, S^2-1	-1, -1

In this case, the incumbent platform already provides a critical mass of users (or content) for interaction, which is why the dominant strategy for each party is to join. Even when other users do not join, the entrant receives benefit from the existing base of users (S^2-1). Because both parties have the incentive to join, it is also the Pareto-dominant equilibrium. Therefore, it is much more difficult for a new platform to attract entrants than for an existing platform with a critical mass. Consequently, even in the presence of multihoming (see Chapter 4.8) and low switching cost, the startup can fail to rally users.

However, the basic chicken-and-egg problem becomes more complicated when introducing dynamic factors, such as time and place. Consistent with the definition of the cold start dilemma, the lonely user dilemma can be defined as follows:

> *In a social platform, when there are no existing users, no new user will have a motivation to join. Additionally, when there are no active users at a given time or place, no other users will use it at that time or place.*

If a user has no contacts in a social service, the perceived benefit of the service equals zero for that particular user at that particular time or place, regardless of the number of registered users or "static" critical mass, such as content, that is always available. In practice, these platforms can include social platforms such as chat services requiring simultaneous presence of parties, and location-based services whereby the interacting parties need to be available at the same time and also in the same place.

In the cold start dilemma, the focus is on recruiting new users (e.g., to generate content) and keeping them active in UG activities. In the lonely user dilemma, the focus is on acquiring users for social interactions taking place between individuals and groups, and keeping this interaction active (i.e., *the problem of active use*) while considering the effect of time. As such, at any given time, not only on average, the platform must have a critical mass to provide matches and thus be useful[99].

[99] Consider the Facebook platform: if in some given time frame, all of a user's friends were offline and had not updated their statuses, eventually the user would permanently stop using the service, regardless of how many registered users there are.

Therefore, the requirement of a critical mass is much more extensive than in the case of static content[100]. In other words, the demand-side benefit in social platforms is derived from social interaction (i.e., social exchange) instead or more or less static content, with the source being topicality, information, entertainment, or other properties of the content. For example, unlike communication between friends, reviews and videos are not social interaction in a fundamental sense[101]. In a content platform, users enter the website for the sake of the content (e.g., news, reviews, articles, and videos), whereas the lonely user dilemma is typically associated with social network sites in which availability of others is conditioned by time and/or physical location. Table 17 exhibits the dilemma.

Table 17 Exhibits of the lonely user dilemma

	Exhibit
[1]	*"I think you need a critical mass in any community and we didn't quite achieve that critical mass. I mean, who wants to go into a forum when there's really nobody to talk to?"* (Warner 2009).
[2]	*"Lastly, the "real-time problem". This one is similar to the location problem in that if someone wasn't online when you were online, they were no good to you. While the real-time chat aspect of the application made for some really serendipitous meetings, it also made it harder for people to gauge the activity of their communities, especially if they logged in at odd hours, people were set as away."* (Bragiel 2008).
[3]	*"We launched our product and got all of our friends in Chicago on it. We then had the largest papers in the area do nice detailed write-ups on us. Things were going great. We had hundreds of active users and you could feel the buzz around it. […] The problem, we would soon find out, was that having hundreds of active users in Chicago didn't mean that you would have even two active users in Milwaukee, less than a hundred miles away, not to mention any in New York or San Francisco. The software and concept simply didn't scale beyond its physical borders."* (Bragiel 2008).
[4]	*"The weakness of the hub strategy was the market players never arrived at the same time. Sellers would flock but there would be no buyers, or buyers would flock and there would be no sellers."* (Anonymous founder).
[5]	*"The real tests come at moments like we had about a week after our initial launch. Lots of people dropped by, told us they loved the site, and didn't come back. So, there we were, left with one big question that lead to endless others: Why aren't they coming back? Is something too confusing? Is our idea a bad one? Do we just wait and see if they come back later? Do we need to build another tool?"* (Karjaluoto 2009).

[100] Here it is assumed that social interaction expires much more rapidly. However, content also expires. If no new content is added, after a while users will stop using it, although the remaining content would continue to provide benefit; this is not the case for social interaction. However, in some cases the *topicality* of content approaches the temporality required by social exchange. Consider, for example, a news portal in which all content has to be fresh.

[101] Note that this does not exclude spillover effects between content and social interaction. In fact, these are generally requisite for UG effects to occur.

We can deduce that the number of users required to initiate the self-replication UG process is often referred to as a critical mass, both in the literature (see the following chapter) and by practitioners [1].

The *coordination problem* [4] is distinguished from the real-time problem [2] based on the notion of time. Coordination fails as a result of an overall lack of participants in the other side. The real-time problem might mean that there is a potential critical mass in the other side, but that they are momentarily inactive[102]. As noted previously, the real-time aspect is emphasized in the lonely user dilemma due to immediacy of social interaction. More precisely, coordination can relate to the participants' different needs, which requires understanding both sides well and managing their expectations. The timing of converting users can be critical here; thus, if the technology is premature, persuading users to join can cause a major disappointment. Basing the platform design on the premise of self-organization might not take place in reality.

Furthermore, in social environments, match is not simply a question of the number of members in group A or B, but also their quality (i.e., compatibility). Match might require a special type of user property relating to, for example, demographics or offline relations. Not all counterparties willing to interact will regularly provide a match[103].

The real-time problem, if defined as 'getting users on board', suggests that solving the cold start problem is insufficient to solve the lonely user dilemma; that is, registering to a platform does not automatically lead to active use, without which, the platform will gradually die regardless of adding new users. This is termed *churn* in marketing and is parallel to pouring water into a bucket with a hole. Thus, while loyalty is low, increasing customer base will only increase cost, relating to lifetime value, as customers constantly abandon the service. In other words, users of a real-time service need to be simultaneously present or coordination will fail. This is crucially different from static content, whereby coordination is much less affected by timeliness.

The *transferability problem* [3] implies that a predominant user base in context A (e.g., location) cannot automatically be generalized as a critical mass in context B (i.e., another location), even when it fits the notion of critical mass in its primary context. In particular, the problem relates to *hyperlocal platforms* such as location-based services. Although our exhibit

[102] How is the real-time problem different from the lonely user dilemma? The former is a manifestation of the latter, in which time is the match-making criterion. However, the lonely user dilemma can be manifested in relation to other match-making criteria, such as physical location and preferences. In both cases, the user is "lonely" without an adequate match.

[103] However, this type of differentiation also exists in exchange platforms. Consider the following criteria for match; for example, item being transacted, condition, reputability, and location of the other party. In general, however, users are more selective in engaging in social interaction with "strangers" than transacting with them.

addresses location, the transferability problem itself can be generalized into any context in which one group is so distinct from another that direct network effects will not emerge across the two groups.

Therefore, the startup needs to consider its match-making role[104] and emphasize user-acquisition based on the development of dynamics between the groups. For example, if there is a shortage of either female or male members in a dating service, more users of the required gender need to be recruited. When there is disconnection between user bases, for example, niche division or geographical distance (i.e., local social networks), there is a shortage of *synergy* between user segments; that is, no positive network effects arise even when the groups are connected. Hence, each segment needs to be built individually due to proprietary network externalities to that community, although the transferability problem [3] will not be overcome unless propagated by members of the community. The benefits for a startup involved in building multiple communities are therefore limited to learning gains, which can facilitate replication of critical success factors, and also potential reputation and brand spillover effects when users in another community become aware of the platform's existence, and perhaps start acquiring its community.

Furthermore, users' homogeneity, defined as similarity of interests, demography, or other feature that increases similarity, might influence the perceived utility of the network by an individual user. These features can include, for example, location, online status, and similar preferences. Diversification is needed if the service is match-making between opposite groups with users looking for counterparts (i.e., buyers for sellers; men for women); thus, homogeneity tends to be counterproductive in two-sided markets[105]. However, in one-sided platforms, users derive benefit from similar users joining the service, which implies direct network effects. They might also appreciate complements by other firms, such as plugins, games, or additional content by third parties within a platform ecosystem, which reflect indirect network effects.

Conversely, when there are users in one side (A) competing for members on the other side (B), each additional user in A in fact reduces the incentive for similar users to join. Strictly speaking, assuming that match-making exhibits rivalry in that connections between members in A and B exclude other

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[104] Essentially, a marketplace platform is a mediator between two parties, often supply- and demand-side, so that it offers auxiliary benefits in addition to matching (i.e., coordinating), such as payment options and vouching.

[105] In a sense, this is a trivial observation. The definition of two-sidedness entails the idea that the groups are distinct. Therefore, similarity merely parallels this state with some actual criteria for distinctness.

connections, this increases competition[106]. Therefore, a high number of members in A represents negative (i.e., direct) network effects for a prospective member of A as they are competing for the same resources (i.e., members of B). The final decision to join is affected by the difference between perceived negative network effects (i.e., the level of competition) in comparison to perceived positive network effects (i.e., the number/attractiveness of group B). Implications such as these will be further discussed in the following literature subchapter.

4.5.2 The literature

The problem of active use is expressed in Albuquerque et al. (2012, 407): "*there are usually two (or more) stages in the decision to participate in a user-generated platform. Users must first opt to visit the site, and once in the site, they must decide to generate and/or consume the available content.*" In other words, acquiring a user is not alone sufficient to guarantee interaction benefits to the other side. A similar conclusion is drawn by Xia, Huang, Duan, and Whinston (2007) who distinguish between the user decision to adopt/join AND to continue use . Therefore, it is acknowledged that the adoption choice is not the only requisite for a permanent solution to the chicken-and-egg problem.

The lonely user problem, therefore, is not only limited to encouraging registrations or other forms of subscription/joining, from which a startup might infer that optimizing registration pages (i.e., landing page optimization) is a top priority, but also to activity taking place *after* the user has enrolled. As presented by Boudreau and Hagiu (2009, 171), "*Facebook must then activate the 'social graph'. Beyond simply establishing linkages among members, it must keep these linkages active, fresh and compelling*". This is a problem as, after joining, the success in fact depends on the community's or platform's activity, which is the source of new users. In fact, if the replication rate or viral coefficient drops below one, the exponential growth stops (Salminen & Hytönen 2012) and, considering churn, the user base can begin to decrease.

Not only this, but it is also possible that users estimate the degree of activity, as it is part of their utility function, prior to joining, and employ this estimation, based on the activity they see when visiting the platform for the first time, as an adoption factor. This would mean that a low anticipated frequency

[106] This might or might not be the case, depending on the strategy of users. For example, in a dating site, a user might stop creating connections to potential dates after finding "the one". However, it is also possible that he/she might continue to create further connections.

of activity decreases the expected utility. It has been previously argued in this study that expected benefits are proportional to expected costs; as such, more time and effort are spent on adopting platforms that are perceived to be genuinely useful. This might seem to be a trivial statement but, in fact, it supports the idea of showing social activity to prospective users in an attempt to persuade them to join, which calls for a different strategy to the walled garden, or bowling pin, strategy often applied to explain Facebook's success (e.g., Spulber 2010)[107].

Second, the real-time problem can be approached through the concept of *synchronicity*. Porter (2004) defines it as the "*degree to which a medium enables real-time interaction*". She distinguishes between 1) synchronous and 2) asynchronous interaction; the former requires that parties are present simultaneously, and therefore corresponds to the definition of the real-time problem. Asynchronous platforms, such as online forums, enable users to browse and create messages at their convenience. Porter (*ibid.*) mentions that a particular interaction design does not necessarily lead to interactivity among users, as users might not behave as expected. Hence, the real-time problem can arise if users are not utilizing real-time features to their advantage. The requisite of timeliness makes it much harder for the startup to generate matches (see Subchapter 4.5.1) than in a registration-based system.

According to Caillaud and Jullien (2003), users might utilize several service providers in a case where one platform does not provide a match. Hagiu (2006) employs the example of *Match.com* to elaborate the need for registration and data collection necessary to create matches through some form of *permanence*. Overall, when introducing social interaction, as opposed to content, and time, as opposed to constantly available content, the chicken-and-egg problem assumes a more complex form.

There are also limitations of network effects both as a concept and as an automatic solution to chicken-and-egg problems in two-sided markets presumed by some startup founders. A definition, in the context of social networks, is given by Mital and Sarkar (2011, 380): "*the probability of a new user subscribing to an application is proportional to the number of the application's existing users. Thus social networking sites exhibit network effects*". Network theory has created many constellations of network value. One of the best known is *Metcalfe's law*, stating that the value of a network is proportional to n^2, where is n is the number of nodes connected in the network

[107] Essentially, the question relates to two alternative choices: 1) hide the interaction or show it and 2) let the content be indexed by search engines or not. What has worked for Facebook might, in fact, be countered by the totally different *open garden* strategy. As such, this is a vivid example of context influencing the implication.

(Gilder 1993). Later, the law was criticized for the fact that not all connections are in active use (Briscoe et al. 2006).

For example, Odlyzko and Tilly (2005) refer to the concept of gravity, which means that local connections are more valuable than those that are more distant, basically negating the assumption of uniform value. As Samanta (2009, 3) notes, simply multiplying the market sides is not a realistic measure for network effects: "*in a large network, such as the internet or a credit card, with billions of potential transactions between buyers and sellers, most are not used at all. Therefore, it would be wrong to assume that the volume of transactions per buyer will grow linearly with an increase in number of sellers*". The aim here is not to go too deeply into the discussion of the nature of "network laws", but to consider how they apply to online platforms.

In fact, the network value debate parallels that in the platform literature. As such, calls for other criteria in addition to network size have been made by several authors (e.g., Farrell & Klemperer 2007; Suarez 2005; Birke 2008). In particular, economists have discovered the limitations of employing the size of a user base as the predominant proxy of network effects. In his literature survey, Birke (2008, 24) argues that

> *"A […] departure from the assumption that total network size matters can be found in some of the newer empirical papers on network effects which argue that social networks are mainly local and that local geographical network size is therefore the relevant network measure."*

Consider that network effects are dependent on contextual factors such as an industry or market, even a company, as a user base of one company, can interact more than that of another company and therefore be more valuable. Suarez (2005, 719) examines network effects at the industry level and argues that

> *"[A]n industry that features very strong ties could simply annul classical network effects […] an industry with moderately strong ties may allow for both strong ties and classical network effects to be significant. Finally, an industry in which weak ties predominate would de facto revert to the classical case, a monolith that cannot be broken into parts on the basis of tie strength."*

Ties are implied by Suarez to increase change resistance (see Coch & French 1948) or switching costs (Farrell & Klemperer 2007). It is simply possible that existing industry relationships, or 'inertia', exceed the expected benefits of network effects. In online consumer platforms, barriers for switching might also involve habitual or behavioral elements relating to learning costs (Farrell & Klemperer 2007) and loyalty; the latter of which being possibly based on seemingly irrational logic such as brand preference (see

Thompson & Sinha 2008). For example, Maicas, Polo, and Sese (2009) refer to *personal network effects* which underscore relativity. According to Maicas et al. (*ibid.*), personal networks influence switching behavior. Intuitively, it can be concluded that personal networks are most likely to affect adoption and usage of a social platform.

In particular, the limitation of network effects in social platforms is noted by Boudreau and Hagiu (2009, 171): "*members care only about their relevant network rather than the aggregate network [so] growth is about expanding a mosaic of social networks rather than scale per se.*" This argument will be discussed below. Second, consider Evans' (2002) requirements for network effects: 1) one agent's adoption of a good, product, or service benefits other adopters, and 2) "*his adoption increases others' incentive to adopt*." Evans (*ibid.*) refers to these two effects as the total effect and marginal effect. However, both assumptions can be contested in online contexts. First, consider inclusion of negative network effects. An example is mentioned by Boudreau and Hagiu (2009, 171): "*Facebook has the challenge of minimizing negative interactions on its platform, ranging from irrelevant interactions, those that are inappropriate to the context, all the way to 'fraudsters' and illicit activity*."

Clearly, all platform types considered in this study are subject to negative externalities emerging from low-quality participation: in content platforms, it is a risk of spam and low-quality content, in social platforms the aforementioned negative interactions, and in exchange platforms, the risk of frauds and scams. Consequently, a startup is obliged to monitor the quality of its user base. In the ideal model, this is assumed to be the task of the self-organizing user base. However, as argued, the ideal in real cases rarely occurs. In fact, the quality of a platform's user base can be defined as a determining factor of interaction.

For these reasons, individuals might prefer to keep their personal *core network* small (Mital & Sarkar 2011). This, again, is not taken into account when modeling only *positive* network effects and network *size*. In fact, the reverse can take place: privacy can explain why some social platforms are more successful than others, and why open inclusion is not always the optimal choice (cf. Boudreau 2010). If network effects are tied not only to quantity, but involve qualitative aspects, the idea of benefits being proportional to the *number* of users is not fully compatible with the notion of the positive nature of network effects. For example, consider spam (i.e., unwanted email messages): when it increases due to more participants joining email markets, the basic premise of network effects would imply that user benefits increase, but clearly this is not the case. Even by restricting the application of the premise to

positive network effects, the implications might not be as fruitful as originally thought.

For example, when a large number of medium-quality content is produced, the marginal effect on overall benefit is much smaller than if the same content was of high quality, or, if medium-quality users join a network, other prospective users are less interested than if high-quality users join[108]. Therefore, although strictly speaking "true", and the network benefit is added proportionally, the proportion is mediated by quality. Obviously, quality is hard to define[109], especially as it can differ according to the preferences of individual users. In sum, applying the notion that *network effects increase in proportion to quantity*, of users or content, can be regarded as unnecessarily delimiting[110]. Although the economic literature tends to focus on positive network effects (see e.g., Birke 2008), users in online markets are easily affected by negative effects such as the aforementioned spam (Hinde 2003) and harassment in social platforms, cluttered or obtrusive advertising on content platforms (Rumbo 2002), and the risk of fraudsters in an exchange platform. Therefore, the issue of negative network effects is crucial in the online context, and should be understood as a potential cost for adoption, or even a barrier.

Moreover, the relationship between installed user base and propensity to adopt is not straightforward. However, heterogeneity of a given user base can impose strong effects on a user's willingness to adopt. For example, consider a 20-year-old user who is looking for a date in a large network, *A*, but each and every one he/she finds is unsuitable. Then he/she switches to platform *B* with a user base of less than half of network *A*'s, and finds a date immediately. Clearly, there are no *real* network effects for her in network *A*, even if it has a larger user base than network *B*. Of course, matching involves a possibility of chance, but perhaps network *A* was targeting elderly users of age 60–70, and this did not match with the searcher's intent. Regardless of the reason, it is insufficient to assume that network effects are uniform across all users, and that they originate only from the size of the user base.

Similarly, we can consider a one-sided platform where convention argues that adding a new user benefits other users of the same type. However, by applying the previous logic from a two-sided market, the marginal increase of network utility by adding user x in side k of the platform for user y in network side f (i.e., the opposite side) will only be positive if the additional user is a

[108] Note that the medium condition is deliberately framed, because low would indicate a negative network effect, whereas medium is a small positive network effect.

[109] See Reeves and Bednar (1994) and Zeithaml (1988) for some attempts.

[110] According to the author's understanding, however, the misconception is not due to the investors of these laws but to the fact they have been later redeployed to contexts missing fit. For example, Metcalfe's law originally described Ethernet connections, not social networks.

suitable match (e.g., of the correct kind, quality, type, or age). In other cases, the increment is either neutral[111] or negative. For example, Farrell and Klemperer (2007, 1974) consider that

> *"[U]sers of a communications network or speakers of a language gain directly when others adopt it, because they have more opportunities for (beneficial) interactions with peers."*

This condition, albeit intuitively making sense, only applies if individuals are interested in communicating with speakers of other languages. If one has, for example, learned a language only to communicate with a spouse, which might be the case in international marriages, again, adding new members will not increase the network utility *in praxis*[112]. Additionally, note the concept of 'peers' in the definition. It might be that the new speaker of the language is a baby on the other side of the world; clearly, proximity in the network influences how realistic it is that network effects become useful.

Even in electronic networks, such as the Internet through which all users have a *theoretical* ability to connect with everyone else, private social networks are often concentrated, for example, by region, age, or preferences (Thelwall 2008), as if to mirror offline proximity conditions. We rarely see random connections in social life, but they have *purpose* that leads to unique, and perhaps unpredictable, network topographies also in a relatively frictionless network, such as the Internet. In other words, we cannot automatically assume that the existence of network size suffices for adoption *per se*, and that if it suffices for *user x*, it will also suffice for *user y*. Therefore, the 'chicken' might not purely be in the size or structure of the network, but in the underlying differentiating factors[113] of targeted users such as, for example, age, location, or preferences.

Banerji and Dutta (2009, 605) come to the same conclusion by stating that "*positive externalities arise from the specific patterns of interaction between groups of users*" as opposed to those that are general. However, given indirect network effects, the issue is slightly more complicated than this. While direct utility derived from a distant user might be zero, or diminishingly low, the

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[111] In fact, from the three types of network effect (i.e. positive, neutral, and negative), *neutral*, which is when the user is indifferent to the other side, can be subtracted. As an aggregate condition this cannot apply, otherwise all users would be indifferent and there would be no interaction, and, thus, no platform. However, neutrality intuitively applies at an individual level. For example, merely adding some random member to Facebook is unlikely to increase a user's interest in the platform.

[112] Note that *on average*, someone from the language community is likely to be interested in communicating with the new person; therefore, *in aggregate*, the benefit (slightly) increases. However, this does not affect the skeptic's or spouse's benefit from the network, as it is not the network that made him/her adopt the language.

[113] In fact, even in Farrell and Klemperer's (2007) definition, this is considered beneficial. However, this elaboration is included to highlight the nature of "beneficial", to avoid the misinterpretation of size of user base as being synonymous with success in achieving network effects.

indirect effect of having a lot of "zeros" adds up to a user base, which provides useful network externalities even when a user is interested in interacting with a selected few. This is elaborated by Arroyo-Barrigüete et al. (2010, 646) who employ the example of Microsoft Messenger in stating that "*at a global level, [adding new irrelevant users] would have an influence due to the fact that, if there are a large number of users, the system will be improved over succeeding versions (indirect network effects).*" Hence, the pool of other users, although individually meaningless to the user, is beneficial *as a group*.

As in the previous example, locality (in a geographic sense) can be associated with social factors and therefore to the strength of network effects. Suarez (2005), referring to Rogers' (1995) innovation studies, asserts that a local community might refuse to adopt a technology with a larger overall user base. This seems to confirm the idea of the transferability problem from one context to another: a local optimum does not generalize to a global optimum. In other words, as observed by some startups in the sample, major dominance in one market might not endure when expanding to other markets. Again, the size of user base does not matter *per se*, and a smaller community with high *consistency*[114] can endure external pressures to adopt technological innovations.

Moreover, Suarez (2005, 712) claims that the *strength-of-ties perspective* is commonly employed in social network theory to imply superiority or inferiority of connections, so that "*relationships among the different actors in a network can be broadly classified into some basic types: strong versus weak ties and direct versus indirect ties.*" If adopting this perspective, weak ties would seem to indicate less significance to platform adoption[115]. This principle was also observed by Rohlfs (1974): "*If an individual's demand is contingent on a few principal contacts' being users, there may exist many small self- sufficient user sets*." Indeed, users behave differently than telephone networks, in which the total utility provided can be parallel to the number of connections it is able to create between randomly connecting users. However, even there the usage of those connections is not uniform, or totally random; for example, some connections are more actively utilized, whereas others are more rarely utilized[116]. Therefore, there is *purposefulness* behind the usage of pre-existing connections; similarly, there is determinism in the way users generate

[114] Defined as strong network effects, and no multihoming.

[115] However, Birke (2008) gives an example concerning why the availability of remote nodes is important. Consider, for example, the emergency number; although rarely utilized, access to it is important to users of the telecommunications network.

[116] *"Texas and Maine may have less to communicate"*, as noted by Briscoe et al. (2006).

connections[117], such as friendships, in social platforms. For example, friendship requests from unknown individuals tend to be rejected on Facebook (Pempek, Yermolayeva, & Calvert 2009). Alternatively, the reverse can occur, and the user actively employs social platforms to find people previously unfamiliar to him or her. It is this 'hidden intent' that complicates modeling network effects.

Consequently, it is important to note that network effects are *one* criterion for adoption, and therefore cannot fully explain it. The superiority of a product can explain cases such as Google overcoming Yahoo, and Facebook overthrowing MySpace, even in the presence of network effects. This principle is mentioned by Farrell and Klemperer (2007, 2012) who elaborate the *Qwerty versus Dvorak* case by asserting that "*[i]f the penalty is small, switching […] could be privately inefficient for already-trained QWERTY typists even without network effects. And evidently few users find it worth switching given all the considerations including any network effects.*" In a similar vein, Suarez, (2005, 711) notes that an "obvious explanation" for deviations from expected network effects are other factors, such as price or technological characteristics.

In other words, network effects are not the only source of benefits derived from adopting a platform; the platform might have stand-alone value (Kristiansen, 1998), or its adoption is the consequence of word-of-mouth. Thus, adoption does not result from network effects but from social effects, such as the *bandwagon effect* (Henshel & Johnston 1987), or from the platform's *stand-alone value*. This suggests startups should not overly rely on network effects as the ultimate goal but also focus on other areas, such as technology, differentiation, and marketing. All of these are potential variables explaining network effects, as opposed to network effects magically appearing from user interaction. This separation principle is at times forgotten also in the literature, which considers network effects to *fully* explain adoption while wondering why, in the presence of strong network effects[118], one competitor overcomes another.

The confusion between differentiation and network effects might arise from the specifications of analytical models; for example, differentiation is not always considered. In such models, network effects portray a situation in which two equally differentiated and equally marketed platforms are competing, which might not always be the case in the real world, by pricing and size of

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[117] Rochet and Tirole (2005, 5) stress this point through the concept of usage: "*The cardholder and the merchant derive convenience benefits when the former uses a card rather than cash; a caller and a callee benefit from their communication, not per se from having a phone; and so forth.*"

[118] This is a special problem of applying the formal models to empirical contexts. In a formal sense, strong network effects are defined so that "*[n]etwork effects are strong if they outweigh each adopter's preferences for A versus B, so that each prefers to do whatever others do*" (Farrell & Klemperer, 2007, 2018).

user base. Logically, such models tend to give results that favor the importance of network effects.

It is possible to take alternative approaches to defining network effects; for example, consider a proposed definition:

> *"In general, the higher the strength of network effects in a two-sided platform (defined as propensity to find a match), the smaller the initial user base required to grow."*

This definition overlaps with viral marketing theory, in which the growth idea is approached, for example, through the concept of a *viral coefficient* (see Salminen & Hytönen 2012). In such a model, the propensity to send and accept invitations defined whether the network experiences exponential growth. Coincidentally, perceived network effects would affect both propensities, so that users are more likely to send invitations, as added users increase their benefit, and accept them because of the benefits provided by the existing network. Again, however, we stumble upon the 'minimum requirement' concept (i.e., critical mass), as the expected benefits of the network are considerably lower if the user base is insufficient to convince invitees to join. Defining the network effects as the propensity of a user to find a match relating to his/her intent avoids the 'quantity versus quality' problem. In this case, both can contribute positively or negatively to the emergence of network effects.

The idea of propensity (i.e., probability) is somewhat compatible with Roson (2005) who argues that, from a demand perspective, two sources for network externalities can be identified: 1) *single interaction* externality, in which "*matching quality improves when more alternatives become available*" and 2) *multiple interaction* externality, in which every user gets a benefit from every interaction by other pairs. However, Roson (*ibid*.) also assumes that quality is improved by the number, not type, of participants.

Finally, we consider the notion of critical mass, as it can be regarded as requisite for the presence of network effects. A two-part definition is offered by Suarez (2005, 718). First, "*A critical mass occurs at the point at which enough adopters have chosen a particular technology that the technology's further rate of adoption becomes self-sustaining*." This indicates self-propagation that was found to be central in the ideal UG model. Suarez (*ibid*.) adopts the second part from Katz and Shapiro (1992): "*the system with a lower installed base enjoys a significant advantage for instance, newer and superior technological capabilities*". Therefore, incumbents are seen to possess *excess inertia* (Farrell & Klemperer 2007) regardless of their quality. There are recent cases in the online market, however, that neglect this 'inertia'. Most currently dominant platforms employed as examples in this study have been

early-movers but not first-movers, first-mover *disadvantage* can arise, for example, as a result of technological inferiority[119]. Evans and Schmalensee (2010, 21) show that "*even without fixed costs or economies of scale, platform businesses typically need to attain a critical mass when they are launched in order even to survive*", which would indicate that a 'go big or go home' strategy is suitable for these markets, and that heavy investments in early marketing to acquire a user base would be required. A critical mass can therefore be defined as the condition between functioning (i.e., realized) and non-functioning (i.e., theoretical) network effects, so that:

No critical mass → no network effects
Critical mass → positive/negative network effects

This is based on the assumption that the network must have some type of minimum participation, not necessarily relating to quantity, before it can produce benefits or matches for users. This is also the position of Shapiro and Varian (1998, 184) who argue that: "*Network externalities make it virtually impossible for a small network to thrive. The challenge is to overcome the collective switching costs that such a network requires to grow.*" In the network economics literature, successful achievement of network effects, in a competitive setting with no multihoming, is often termed *tipping* (e.g., Katz & Shapiro 1994), meaning that once a rival technology reaches a particular degree of adoption, all industry participants migrate to support that technology. Such is the case concerning standards (e.g., Farrell & Saloner 1985).

When the winning design emerges and industry participants become aware of its predominance, they will start supporting it and abandon other standards (Katz & Shapiro 1994). Therefore, multihoming can exist, in this type of setting, only *until* the dominant technology has been decided, after which all players will single-home. However, if there is interoperability between technologies, which is not the case for mutually exclusive standards, the behavior might be different and the market might eventually become oligopolistic; that is, comprise many standards or platforms (e.g., Hagiu and Wright 2011). More precisely, this can be seen to be the case for many online platforms that all have internal consistency in terms of critical mass (i.e., users who are compatible with each other to the extent that matches can easily be created), but none has an absolute dominance of the market[120].

[119] Technical problems are commonly acknowledged as one of the reasons for Friendster losing to other social networks.

[120] For example, there are several competing online dating platforms, which is possible due to users multihoming or otherwise preferring one platform to another.

However, at the same time, this is contrary to Shapiro and Varian's (1998) argument, which supports the notion that industries with strong network effects gravitate to the leading platform. The difference is in the notion of 'industry' versus 'market', and standards and compatibility. If we change the unit of analysis from an industry, in which it makes inarguable sense to employ compatible technology through standardization, to different market verticals, we can better understand the outcome in the case of many two-sided markets, including those online.

Nevertheless, a critical mass cannot be seen to equal stable market dominance, although it might imply niche dominance, assuming lower competition. Niches, therefore, are local targets as opposed to mass markets. In the study's sample, a startup faced special problems of hyper-local communities (see the previous chapter). In particular, the issue is that dominating one local niche does not automatically lead to advantages when moving beyond the niche; that is, network effects do not generalize. This becomes a problem when a particular niche is insufficient for viability or the goals of the startup.

Thus, the *non-transferability* of network effects can become an issue in the differentiation strategy, if segmentation is too narrow, or if markets are naturally isolated (e.g., cities in some circumstances) or exhibit social dissimilarities. Hence, the existence of the transferability problem, as described in the definition, has been noted in the literature.

4.5.3 Solution: Remora

As noted in Subchapter 4.5.2, the practice of a platform drawing benefit from the user base of another platform bears similarity to *envelopment* in the platform literature. It is described as follows (Eisenmann et al. 2011, 1271):

> *"Envelopment entails entry by one platform provider into another's market by bundling its own platform's functionality with that of the target's so as to leverage shared user relationships and common components. Dominant firms that otherwise are sheltered from entry by standalone rivals due to strong network effects and high switching costs can be vulnerable to an adjacent platform provider's envelopment attack."*

Envelopment, in this sense, is an aggressive strategy that aims to replace the target platform by making its pre-emptive assets, namely high switching cost and strong network effects, ineffective. However, as previously noted, the remora strategy aims at becoming a complement instead of a substitute. Due to power imbalance in a remora setting, the remora is not aiming to replace but accommodate the host (see Figure 12).

However, Eisenmann et al. (2011) name the following industry examples of envelopment: PayPal → *eBay*; Google Docs/Chrome/Android → *Google search*. Therefore, envelopment can take place as a market diversification strategy in which the platform draws from its own user base in a different vertical. Clearly, Google is a strong example of such an expansion, as it currently provides more than a dozen services that more or less relate to its core functionality (i.e., search). In a similar vein, Ries (2011) notes that "*many […] viral products didn't really build their own working ecology: they colonized someone else's. That was true for PayPal cannibalizing eBay, YouTube and MySpace, and could still be true of Slide, Zynga, or RockYou – we'll see*." The "colonization", as argued, is beneficial for both parties in the case of complements.

Even in eBay's case, PayPal provided a useful auxiliary service that was missing from eBay's own selection. eBay tried to introduce its own version, termed BillPoint, which is an example of substitution by the host, but failed due to better marketing strategies employed by the remora. According to Mas and Radcliffe (2011, 311):

> *"PayPal faced a constant fight with their ecosystem host, eBay, once eBay realised that some of the value from their customers was going to PayPal. As the owner of the platform, eBay sought to derive significant advantage from integrating its own payment engine into its marketplace website. […] Ultimately, PayPal knew that their continued success was going to be dependent on eBay's not shutting them out of their auction website entirely, so they sought increasingly to diversify from eBay auctions […], and eventually sold out to eBay."*

This case demonstrates well the hazards of a remora. First, competition from the host platform that, after discovering the remora is grabbing a disproportionate amount of its user value, reacts by introducing a substitute, then, the danger of being denied access and, finally, being absorbed by the host, in a form of acquisition. It also demonstrated diversification as a means to counter the threat of the host, which will be discussed in the following chapter. Notable industry cases include Twitter's acquisition of *Tweetdeck* (Parr 2011b) and Facebook's acquisition of *Instagram* (Constine & Kutler 2012). In Facebook's case, its strategic goal was to make the acquired company a complement for its own platform, thus enabling better photo sharing. In Twitter's case, the rationale had to do with substitution. In other cases, the remora is not so lucky, with the host eventually absorbing its product *ideas* as features in the subsequent release.

Eisenmann et al. (2009, 225) elaborate the problem of substitution-through-absorption:

> *"Dependency also came with a danger […] Many software executives wondered if they could trust ambitious Microsoft employees with sensitive information. Executives […] had seen the innovative features of prior software show up as features in later versions of Microsoft's products [and] wondered if their employees' conversations with Microsoft's technical staff would contribute to seeding a future competitor."*

Whereas, in a standards and technology setting, a firm can protect its intellectual property rights (Church & Gandal 2004), abstract ideas are not patentable in most countries. Features absorbed by Microsoft include, according to Parker and Van Alstyne (2008), disk defragmentation, encryption, media streaming, which is also employed as an example by Eisenmann et al. (2011), and Internet browsing. Absorbing has also been documented in the Web environment (Parker & Van Alstyne 2008, 2): "*Whether through internal development or acquisition, coercive or not, platforms such as Apple, Facebook, Google, Intel, Microsoft, and SAP have routinely absorbed valuable features developed by ecosystem partners.*" Parker and Van Alstyne (2008) go on to state that absorbing developers' innovations can reduce their incentives to continue developing for the platform, given they remain uncompensated[121], and can lead to developers exiting the platform. A case of *developer flight* in the videogames market is described by Eisenmann et al. (2009, 151):

> *"If an incumbent has been too aggressive in extracting value, demand- and supply-side users may rally around entrants […] When it dominated the console market, Nintendo dealt with third-party game developers in a hard-fisted manner. Consequently, developers were pleased to support Sony when it launched the PlayStation console in 1996."*

Consequently, it is a useful tactic to attract remoras for the host not only because they increase network benefits for the demand-side, but because they can provide ideas on how to improve the core platform. At the same time, over-exploitation of their ideas provides a negative incentive to continue collaboration. A similar effect can take place in the demand-side where, for example, privacy issues might become a concern[122].

Exclusion, or denial of access, is similar to a counter-envelopment strategy depicted by Raivio and Luukkainen (2011, 79): "*The envelopment threat refers to a case where we have several platform providers and common*

[121] In contrast, some startups welcome acquisition as an exit strategy, and therefore cases of *absorbing-through-acquisition* would increase the incentives of such startups to join.

[122] This was noticed by Facebook as a competing project termed *Diaspora* gained much success in a crowdfunding platform; Diaspora aimed to attack Facebook's privacy-related weaknesses by promising a more secure platform, although it later failed.

customers. In this situation one provider may try to exclude other platforms from the market." It might not necessarily be that the platforms are competing in the same market, but if the host perceives the remora taking advantage of it without reciprocity, it can resort to denial of access. For example, such was the case of Craigslist (i.e., general exchange platform) cutting access of AirBnB (i.e., specialized exchange platform), a peer-accommodation service[123]. In particular, the value of content can be seen in a platform strategy termed *walled garden* (e.g., Berners-Lee 2010), in which the platform owner restricts the visibility of information to search engines[124] that are known profiteers of capturing economic value from third-party content.

According to Eisenmann et al. (2009), specific results from the hold-up problem might include 1) limiting quality of cross-platform transactions, 2) raising prices, and 3) charging for interoperability rights. In particular, the platform host might *deliberately* "*limit the quality of cross-platform transactions to maintain differentiation*" (Eisenmann et al. 2009, 138). Charging for interoperability rights as a strategy for the host to improve its margins can include charging startups for API units[125]. In turn, a startup is initially a weak platform that hinders its ability to utilize the same strategy of monetizing API usage. The following figure illustrates how the standard remora strategy differs from envelopment.

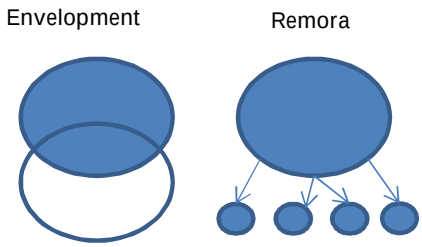

Figure 12 Remora and envelopment

Consider that, as soon as the number of complements exceeds a particular threshold (e.g., they fulfill categories needed for inter-platform competition), the group itself is enough for the platform owner, and individual developers become expendable. This logic can be employed to explain power asymmetry

[123] In this case, cutting access to posts would negate *aggregation*, whereas preventing auto-posting would remove automatic access to users.
[124] For example, most Facebook content cannot be accessed by Google; therefore, Google started its own social networking platform, *Google+*.
[125] For example, such a practice is operated by Google (i.e., *Google AdWords*).

between the developer community, which is fragmented and competing, and the platform owner that is concentrated and a monopoly within the platform. When dissatisfied, the host can more or less replace individual complements as new entrants are interested in taking their place. However, if the entire population turns against the host for some reason, the momentum will be reversed and the host will quickly lose popularity. In the case of envelopment, the relationship is more hostile, and the counterparty is interested in replacing some or all of the host's functions.

This chapter has shown how remora's curse relates to the literature. We have employed theoretical constructs such as hold-up to understand the problem, and cited industry examples of both the remora strategy and the host's opportunistic behavior. However, we have also argued that the host's opportunism is curbed by 1) multihoming behavior and 2) the risk of adverse selection to restrain its use of power.

4.5.4 Discussion

When the number of users is zero and the benefit derived from the product by the user depends on the number of other users (i.e., direct network effects apply), the benefit provided by the product to additional users also equals zero. Therefore, no rational users join. This notion is applicable to both one- and two-sided markets[126]. Within two-sided markets, under indirect network effects, when users of one (i.e., supply) side have no match from the other (i.e., demand) side, there is no incentive to join, regardless of the number of other users in the same side, and *vice versa*.

As the number of relevant contacts increases, so does the perceived benefit of joining the network, even up to the point where the user feels social pressures to join. Both buyers and sellers need to be present in an exchange platform, or marketplace, otherwise the service provides no benefit for the user. In contrast, when users fail to actively utilize the platform, it becomes a *cold platform*, which explains why MySpace lost to Facebook, regardless of the critical, although static, mass acquired. It also implies that a critical mass should not be measured by the number of connections (i.e., Metcalfe's law), but as the number of interactions across time. The number of interactions indicates active use, which is as substantial a problem for a startup as the cold start problem.

[126] Their difference is that, in one-sided markets, users are of the same type (e.g., friends in a social network), whereas a dual-sided market addresses two different types of user (e.g., sellers and buyers) who are influenced by one another.

The literature survey provided useful approaches to understanding the nature of the lonely user dilemma. Central to this is that the first models focused on how the network appears to an outsider, not how the connections are employed. It was later discovered that the structure and usage of a social network are closely tied to one another; the connections emerge between people who share interests or are also associated in offline interactions, which forms the potential of the network usage. Consequently, *realized*, not theoretical, interaction is required for the UG benefits at which a startup aims. Inarguably, without active use, the potential of the platform does not sustain, which is depicted as liquidity in the early platform literature and as the *problem of active use* here; possible even when the cold start problem is solved.

The problem of active use is, in fact, quite important as it relates to sustaining the perception of utility. While strong network effects can quickly grow a user base, with low loyalty the platform faces considerable *churn*, which leads to a reverse effect of exponential growth, a sudden decay. For example, if lead users or top contributors of content exit the platform, their followers might easily follow, after which the followers of those followers exit, and so on. Diffusion and churn can therefore be perceived as being subject to *herd behavior*. This obviously implies that the startup is advantaged by keeping the community active, after it has been established.

The real-time problem adds a temporal component to the lonely user dilemma. Put simply, at any moment in time, there needs to be a critical mass of users active in the platform. As the potential moments of time extend well beyond storing the interactions (e.g., messages saved in an inbox), potential connections are much scarcer than in a non-real-time social network. Essentially, the startup has a major coordination problem, as people do not necessarily connect to the platform at the same time as other users. At best, this pattern is hard to control[127]. The real-time problem concerning simultaneous entry of sides is consistent with the literature. If the requirement of simultaneous presence is strong, there is no solution other than efficient coordination of user flows; for example, based on the hour of day, day-part advertising, and focusing on the side lacking members. There is likely to be a threshold up to which the lack of counterparts is tolerated, with the user retrying at a later time.

Additionally, even the usefulness of content can have a temporal nature, because new and different content is required by new and different users. Regardless of this "timeliness of utility", the lifetime of content can be regarded as long, even infinite. While it remains in the Web server, it exists, as opposed to users who log out, and can be indexed and shown by search engines,

[127] An exception would be when the platform is tied to a specific event (e.g., a football game); then, all participants would self-coordinate to be simultaneously present.

thereby providing visitors with consistent value[128]. Obviously, some pieces of content (e.g., "classics") hold their utility longer than others.

Moreover, it was found that the conceptualization of network effects, namely their contrast to the size of the user base, might be problematic. Understanding the motive to join seems to be associated with deviations of economic rationality, even if optimizing social utility replaced profit-seeking. Therefore, altruistic behaviors and group dynamics can come into play. The critical mass phenomenon, the author believes, cannot be explained *only* by network effects and the growth of utility. Other phenomena such as the bandwagon effect and herd behavior are most likely involved. Whether they are perceived as rational or not, is a different matter.

If network size is not the correct metric to indicate network effects, and locality has been perceived as more important, what does this imply? In a sense, that 1) expectation of close proximity (e.g., city; local community) is useful for the startup, but 2) under UG, the network structure spawns from the user base. These are complementary remarks in the sense that, given the information based on which one can assume greater consistency among the network unit, the startup should target that unit as opposed to employing mass marketing, even when mass markets are the goal[129]

Relating to other reasons for adoption, consider a user joining the dominant platform instead of a startup platform. In some cases, the motive for non-adoption might not lie within the stronger network effects of the dominant platform but the in the fact that it offers a better solution. This is an important notion, which arises from the marketing assumption that people join platforms to satisfy a need, as opposed to the platform assumption that they join because there are network benefits. Here, theories can confuse the direction of causality; namely, that network effects would be the sole motive for avoiding switching while, in reality, loyalty is a more complex phenomenon[130]. As noted in Subchapter 4.5.1, loyalty is a critical factor in sustaining the level of active use, which is also a requisite for the realization of network effects.

The platform literature refers to marquee users, whereas this type would be described in the marketing literature as opinion leaders, individuals characterized both by a large number of connections and their associated *social capital*. However, the essential conclusion is that marquee users are not only able to increase the network effects of a given platform but regular "John and Jane

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[128] An illustration of the lifetime value of content can be seen in Jacob Nielsen's (1998) article, in which he describes how visitors to his popular blog articles have increased over time.

[129] However, for example, mass advertising can bring legitimacy to some platforms, which is especially important in the B2B context. An interesting case study on the topic can be found in Mas and Radcliffe (2011).

[130] Other criteria such as usability, trust, and features of the platform are likely to affect adoption/loyalty.

Does" can increase the utility of the network as they provide a better match for other "regular" users, which contrasts somewhat to the traditional marketing convention of targeting 'lead users'[131]. Network effects are a coordination game, not a pure game of numbers.

In sum, through a literature survey, it has been shown that there are specific cases in which quantity does not apply as a proxy to network effects. These include, at least, the following:

- The presence of *negative network effects* (e.g., spam; socially undesirable connections).
- Whenever the user base is *non-homogeneous*; that is, in most cases of content and social connections in which both access and quality of interaction are important.
- When there are *other motives for adoption*, so that network effects do not explain platform adoption, switching, multihoming, or refusal to adopt to the full extent.

Thus, the effectiveness of network effects in accumulating a user base depends on circumstances such as industry, quality, interoperability, and multihoming behavior. Users act purposefully and are influenced by social motives; modeling their connections without taking motives into account portrays an inaccurate image. The author has also proposed an alternative approach that, rather than merely the number, involves the probability of matching as a proxy for network effects. This approach is conceptually more accurate as it generalizes across a large variety of perceptional factors that influence network effects such as, for example, demographics, preferences, intents, and location.

In brief, it can be concluded that not only the number of connections is of consequence, so is their interdependence. This can be termed quality or relevance, depending on the conceptual perspective. However, it is fundamentally linked to the fact that people value some social connections more highly than others, and that some connections are more frequently utilized than others. Understanding these statements from earlier theories can provide useful guidelines for Internet startups.

[131] However, it is not suggested that targeting lead users would not be a worthwhile investment of marketing efforts; simply that, in the context of network effects, their increment to the network utility is proportional to the increase of adding probability of matches, not the size of their network.

4.6 Monetization dilemma

> *All companies at some point must start generating revenue to remain viable.* (Lincoln Murphy)

4.6.1 Definition and exhibits

The monetization dilemma occurs when a startup needs to decide whether to offer its platform for free at the loss of business viability, or charge for the access and/or usage at the loss of users' willingness to join. In other words, willingness to join (WTJ) and willingness to pay (WTP) are in conflict.

The following table presents exhibits of the dilemma.

Table 18 Exhibits of the monetization dilemma

	Exhibit
[1]	*"This post attempts to summarize the [startup's] story: how we got to be the most heavily used browser synchronization service in the world and yet still find ourselves pulling the plug."* (Agulnick 2010).
[2]	*"For four years we have offered the synchronization service for no charge, predicated on the hypothesis that a business model would emerge to support the free service. With that investment thesis thwarted, there is no way to pay expenses, primarily salary and hosting costs. Without the resources to keep the service going, we must shut it down."* (Agulnick 2010).
[3]	*"The thesis of our business model […] was that there was a need for video producers and content owners to make money from their videos, and that they could do that by charging their audience. We found both sides of that equation didn't really work. […] Video producers are afraid of charging for content, because they don't think people will pay. And they're largely right. Consumers still don't like paying for stuff, period."* (Diaz 2010).
[4]	*"[E]ven if enough people wanted the product, the business model around it is something which we haven't been able to figure out. We have the product's version 2.0 sitting ready […] but we do not see a clear exit yet, so are hesitant to launch it. Being blogged about major tech blogs […] we already got that love. If we stayed out in the market more – we'd probably get more 'love'. But 'love' can only keep the servers humming for so long :)."* (Anonymous founder).
[5]	*"The experience has made me ask myself almost every time I see a cool web app – 'OK, but how will it make money?', and if it can't, then it would not be more than a short-lived dream for its founders and backers."* (Anonymous founder).
[6]	*"I felt like getting into the monetization stage was going to be long and difficult. And it was one of those businesses where I liked the idea, but I didn't think about monetization before I started, because it was kind of a sexy idea, for me at least. And, I got some traction. I ended up with a few thousand subscribers in a few weeks with the help of some larger companies that were helping me out at the time. And, I kind of realized that to make my first dollar was going to be a long time away […]."* (Warner 2012).
[7]	*"Despite having over 200 beta testers at launch, it proved difficult to convert them into customers. My prices started at $10/month, and though in my eyes this was a bargain, my product didn't demonstrate enough value to enough of my market quickly enough to justify the operational costs of the business and my personal expenses."* (Newberry 2010).

As the monetization dilemma relates to generating revenue, it takes place independently of the size of user base ([1], [2], [4], and [5]), regardless of how substantial this is; therefore, it concerns even popular platforms, such as Twitter[132]. Consequently, popularity among users does not automatically lead into financial success, unless successful monetization occurs. Other key tenets of this dilemma are that the willingness to pay (WTP) of users in online platforms is low [3], monetization requires time and effort [6], and even low prices may not be "low enough" to attain WTP [7].

The dilemma is based on two critical conditions, which here are termed the payment and revenue hypotheses:

a. *Payment hypothesis*: If a startup offers a paid product, it acquires zero or very few customers; the potential risk here being *illusion of free*.
b. *Revenue hypothesis*: If the startup offers a free product, it earns zero or very little revenue (i.e., *problem of free*).

Seemingly, the startup cannot win. The dilemma therefore addresses difficulties of both direct monetization (i.e., impossible to gain users) and indirect monetization (i.e., impossible to create business); the former being impossible under the premise that users refuse to pay when charged for access or usage of a platform, and the latter under the premise that the startup is unable to execute a successful model of indirect monetization even after gaining users, which leads to an unviable business in the long run[133].

The following table displays a choice matrix of the dilemma.

Table 19 Monetization dilemma simplified

	Paid product	**Free product**
Result	No users	No revenue

Major underlying assumptions, in economic terms, include high substitutability between products (i.e., competition), low switching cost[134] between them, so that users can easily switch providers and therefore cannot be locked in, for example, by 'bait and switch', and strict homogenous price sensitivity

[132] Twitter's monetization troubles are well known in the industry (see e.g., Wired 2008).

[133] Although, in the short term, this problem can be removed through venture funding; the goal being to "capture market, monetize later". This strategy, however, depends on successful implementation of the indirect monetization model, not assumed in the dilemma's premises.

[134] *"A consumer faces a switching cost between sellers when an investment specific to his current seller must be duplicated for a new seller"* (Farrell & Klemperer 2007, 1977).

whereby all customers always choose the lowest price, so that users move from paid to free. Further, it is assumed that differentiation has no impact on WTP. If even one of these assumptions were incorrect, one of the hypotheses would fail, and the dilemma would dissolve. Consider the assumptions: first, substitutability refers to the possibility of replacing the startup's product with competing products, which might or might not be true, totally depending on the product. If the startup has created something that no competitor can replicate, its product cannot be easily substituted and it would then be fair to counter the first hypothesis and assume that users would be willing to pay for the product, assuming that the differentiating property is something they *want*; mere differentiation is insufficient.

From this abstraction, the nature of differentiation can be deduced. Whether or not there is differentiation is irrelevant unless its nature leads to positive WTP. The payment hypothesis argues that WTP is zero, thus any condition that negates this argument invalidates the dilemma. The premise of competition assumes an association between competition, differentiation, and WTP, which are practical issues that the startup needs to consider in determining the validity of the hypothesis in its case[135].

Price sensitivity is a key assumption, and a simple game demonstrates its meaning. Consider, for example, a game in which players can choose between free and paid versions of a product. The free version is of inferior but sufficient quality, whereas the paid version is of better quality although costly. Both players are price sensitive; that is, price is more important to them than quality.

Table 20 Price sensitive (both)

		B	
		Free	*Paid*
A	*Free*	2, 2	3, 1
	Paid	1, 3	1, 1

The paid version can be more desirable if price is not included. However, because it is, the dreaded cost makes price sensitive users prefer the free over the paid version. Both users want to avoid a situation in which they are paying and the other one is free riding. The free rider's payoff is 3, because the

[135] This estimation is required *ex ante* as the startup needs to decide on the monetization model. However, the decision is not necessarily irreversible, although moving from free to paid might be more difficult than *vice versa*.

paying party helps to keep the platform free. The dominant strategy for each player is to move from paid to free (1 → 2 and 1 → 3). Hence, neither of them will pay.

Now consider the reverse, when the other player (A) is not price sensitive, but prefers the premium features of the paid version.

Table 21 Quality sensitive (A)

		B	
		Free	*Paid*
A	*Free*	1, 2	1, 1
	Paid	2, 3	2, 1

Because A is not sensitive to price but quality, and the paid version offers better quality, A will always prefer the paid version, regardless of B's choice. This is similar to generators always preferring to produce content, except in a standalone sense. Whereas generators derive benefit from the existence of consumers (i.e., positive indirect network effects), paid users are indifferent to free users. Free users, however, enjoy benefit from paid users, because *in the long term* they help to keep the platform free. Therefore, the free user's payoff is 3 when there are paid users. From A's perspective, however, there is no free rider problem as he/she is not price sensitive. He/she will not switch from paid to free, and B will not switch from free to paid; thus, there is a stable *Nash equilibrium*[136]. Consider, however, that the free users now have an incentive to keep paid users on board. The startup can leverage this as a part of their UG strategy. Moreover, it becomes a *marketing problem* for the startup to find users who are more quality- than price-sensitive, and a *product-development problem* to provide such quality that satisfies them.

Second, low switching cost implies that any lock-in mechanisms are weak and, if fees are introduced, users can easily switch between alternative platforms. This invalidates 'bait and switch' type of solutions; for example, first offering free product and then charging for it. Given price sensitivity and low switching cost, the user would abandon the platform when fees are introduced. In the case of online platforms, switching costs are typically reduced by high interoperability (e.g., API access), advanced import/export functions offered by platforms that exclude proprietary storage of data, and the relatively small

[136] Neither player can improve, given the choice of the other player (Nash 1950).

learning curve of new platforms as Web services might follow the same conventions (see Cappel & Huang 2007).

Third, price sensitivity implies that users choose the platform based on price and will therefore prefer free platforms to paid ones, even if this means sacrificing some quality or features, a type of behavior termed *satisficing* (see Simon 1956). Similarly, if a platform is initially free, to solve the cold start problem, but later turns to paid, to solve the monetization problem, that is, applying the *bait and switch* strategy, users will exit the platform. Given the number of substitutes, they will always have a fallback. Therefore, if the assumption of price sensitivity is correct, the payment hypothesis is true. Price sensitivity sets it so that users have low WTP. Note that these premises are neutral with regard to multihoming (Armstrong 2006); users might multihome or not, but the introduction of fees would prevent adoption.

Fourth, it must be noted that if a startup is successful in indirect monetization, it will not fall into the problem of free and the dilemma will dissolve. That is, indirect monetization is only a solution when it is successful; *a priori*, this can be difficult to determine, which is why the author hypothesizes that startup founders might be more likely to underestimate their ability to directly monetize and overestimate their ability to indirectly monetize.

Moreover, the notion of competitiveness in the definition is important, but only indirectly. As noted, competition only matters if the lack of it is not due to a lack of demand; that is, in markets where there is no demand, there is no market although, at times, startups plan to create new markets. Second, the offsetting factor to competition if differentiation, by which firms are able to overcome competition. However, differentiation only matters if the differentiating factor is perceived as more beneficial by the user. Some startups are able to articulate differentiation although *in praxis* the difference can be trivial to end users.

Finally, the hypotheses are subject to false confirmation (see e.g., Chesbrough 2004), meaning that their truthfulness might be incorrect. Consider a hypothesis that is rejected even if it is true[137] or, conversely, a hypothesis that is accepted when it is false. This relationship between validation and truth is depicted in the following table.

[137] Depending on the ontological position, truth can be defined as an objective property of the nature (e.g., a law of physics) or an interpretation of the ideal condition (i.e., "social law").

Table 22 Truth and assumptions

		Reality	
		True	*False*
Beliefs	*True*	True	False positive
	False	False negative	True

To elaborate, in some cases users might exhibit behavior that is non-price-sensitive: behavior that exists both offline and online. For example, every day, some users pay Spotify for access to music, Netflix for access to movies, and Dropbox for virtual storage space[138]. In cases where there is a motive to pay but the startups abandon the alternative based on the payment hypothesis, it is subject to a special case of confirmation error (i.e., false positive; see Table 22) that the author terms *illusion of free* (see Chapter 6.4). Under this condition, the startup is choosing *freefying* by default as it makes the assumption that, without facts and contrary to the truth value, users would not be willing to pay for the use of product, content, or access to a platform[139]. Therefore, there is a risk of *false positive*: Users are willing to pay for the product, contrary to the founder's belief. This is quite a significant risk as a startup faces a choice horizon that might include creating products for which a proportion of customers would pay, which is an opportunity neglected in the case of the false positive, and the choice horizon becomes constrained to free offerings. Therefore, the false negative might not only harm monetization but lead to neglecting the discovery of other types of product and market space, otherwise termed missed opportunities.

As previously stated, the dilemma will dissolve if the startup is unable to successfully implement the indirect monetization model, as Google achieved by aggregating Web content. There are, however, empirical foundations (i.e., reported by failed founders) to believe that indirect monetization is not as straightforward as many founders assume, which will be discussed in the following subchapter.

[138] It must be noted, however, that none of these services incorporate UG as the content production mechanism. Nevertheless, this is irrelevant with regard to the premise of WTP.

[139] In brief, WTP is assumed to correlate with willingness to join. Were the reverse shown, there would be grounds to discard the dilemma.

4.6.2 The literature

In addition to the scholarly literature, there has been substantial discussion among startup practitioners on the sustainability of free models (see e.g., Murphy 2011; Chen 2009; Kopelman 2009). Therefore, both academicians and practitioners acknowledge the problem. This subchapter will focus on the conditions of monetization in two-sided markets or, as put by Evans (2003), "internalizing the externalities".

As noted, the problem of monetizing online offerings has been identified in the literature. For example, Beuscart and Mellet (2009, 166) note that viable businesses must be "*built around free access to content and principal services; economic strategies mostly depend upon the sites' ability to monetize their growing audiences*". Also in the platform literature, Rochet and Tirole (2005, 6) state that "*[m]anagers devote considerable time and resources to figure out which side should bear the pricing burden, and commonly end up making little money on one side […] and recouping their costs on the other side*." In a similar vein, Teece (2010, 172) argues that "*[w]ithout a well-developed business model, innovators will fail to either deliver or to capture value from their innovations. This is particularly true of Internet companies, where the creation of revenue streams is often most perplexing because of customer expectations that basic services should be free.*"

The technological nature of the Internet, as a communication network, is compatible with creating platform-type of businesses. Clearly, technology provides an apt solution for coordination problems that are difficult to handle via manual coordination and negotiation (see e.g., Argyres 1999), which increases the feasibility of entry. Second, various open-source platforms compete with commercial platforms (Mian et al. 2011). While open source as a phenomenon generally increases social welfare (e.g., Lerner & Tirole 2004), open-source platforms are perceived as substitutes to commercial platforms, and therefore create pressure for free offerings. It is often assumed that the marginal cost of distributing an information good is close to zero, or negligible (e.g., Shapiro & Varian 1998; Niculescu & Wu 2013).

However, supporting users in a platform is not equivalent to this assumption. Free users are associated with marketing cost (i.e., user acquisition), servicing costs (e.g., bandwidth), and support cost (i.e., customer service)[140]. Therefore, although low, the marginal cost of free users is not zero (Murphy 2011). How close to zero it is depends on the cost structure of the individual startup; in any case, subsidizing free users comes with a cost. Furthermore, the

[140] Although it can be assumed that the 'free' property in a good makes an average user less demanding compared to paying customers.

cost is directly proportional to adding users, which means that if there is an exponential growth of users, the costs also grow exponentially. Hence, a successful startup, in terms of user growth, typically requires external funding as it needs to cover expenses from growing the user base without being able to monetize it directly. This has been the case for most of the famous Internet platforms: Facebook, Google, Twitter, and even PayPal (Mas & Radcliffe 2011). Consequently, basing the free pricing strategy on the information-goods argument does not appear to be valid.

Nevertheless, there are properties that can validate it, which relate to the nature of two-sided markets. Pricing in a two-sided market can deviate from that in a one-sided market, in that equilibrium pricing might not be equal to marginal cost when examining the sides in isolation (Evans 2003). In contrast, it is a part of a larger equilibrium where both sides are concerned. This makes subsidization, and making a loss in one side, a possible strategy[141]. In their model, Parker and Van Alstyne (2005, 1494) show that "*even in the absence of competition, a firm can rationally invest in a product it intends to give away into perpetuity.*" It is assumed that the losses will be recovered either by taxing the other side of the market, or raising prices after the platform reaches market dominance. Theoretically, premium sales should cover, and exceed, the costs of serving free users, so that the firm is profitable (Parker & Van Alstyne 2005). As the user base benefits from a positive feedback-loop, free users attract paid users who, in turn, attract more free users, and so on. This characteristic of the network effects makes it difficult to estimate *ex ante* which price level is correct; that is, how much subsidization the platform can provide and still become profitable in the long run.

Despite conflicting perspectives, the argument for low cost of digital services is strong (Parker & Van Alstyne 2005, 1503): "*This strategy also takes advantage of information's near zero marginal cost property as it allows a firm to subsidize an arbitrarily large market at a modest fixed cost.*" Based on this study, setting up the platform cannot be termed "modest fixed cost". However, in a similar vein, Fletcher (2007, 221) notes that "*the prices charged on one side of the market need not reflect the costs incurred to serve that side of the market.*" Finally, Evans (2002, 68) argues that "*there is not necessary relationship between price and marginal cost on either side of the market. In fact, the price on one side of the market could be well above marginal cost while the price on the other side of the market could be below marginal cost.*" However, this implies that the rule of marginal cost being zero for information goods does not apply for pricing the premium product, as there is a

[141] However, *"[l]osing money initially to buy penetration can also be an important phenomenon in one-sided networks"* (Evans 2002, 57).

disconnection between the two sides. In effect, the startup needs to consider both the acquisition and serving cost of the premium side and also that of the free side. This is a central conclusion from the *disconnection of sides* (cf. Evans, 2002[142]).

Therefore, employing the marginal cost theory of information goods is not appropriate for two-sided online platforms, the price structure for which is dual-sided, comprising 1) fixed development costs, 2) acquisition cost of free users, and 3) service costs (e.g., bandwidth; customer support) of free users, 4) acquisition cost of paid users, who convert instantly, 5) conversion cost of paid users; (i.e., cost of converting activities, minus cost of acquiring free users), and 6) service cost of paid users. This price structure needs to be considered in pricing strategy, which, as demonstrated by the study's sample, is unfortunately not always the case. Furthermore, in the case of subscription-based charging, as is the case for many so-called SaaS startups (Xin & Levina 2008), the pricing strategy needs to consider the expected lifetime revenue of the average customer, resulting from the lifetime and service level chosen[143], time required to convert free users to paid customers, the percentage of this conversion, and the average lifetime of a paid customer.

In the practitioner's side, Anderson (2009) claims that "*practically everything Web technology touches*" will end up as free for consumers, as the marginal costs are approaching zero and prices are approaching the marginal cost, and as "*there's never been a more competitive market than the Internet*". Although not a part of academic debate, this perspective has proved popular among startup practitioners and managers, even reaching some kind of paradigmatic status[144]. However, a counter-argument to this claim can also be found, and it comes from Bekkelund (2011, 16) through a simple but powerful connection to Hal Varian's earlier contribution:

> *"Based on the arguments in Varian (1995) it is likely that the prediction of free products on the Internet in Anderson (2009) only yields for purely competitive markets, i.e. when there are "several" producers of an identical commodity. On the other hand, it is not necessarily true for markets with monopolistic competition, i.e. when there are several somewhat different products, some of which are close substitutes."*

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142 *"Indeed, a key feature of these [two-sided] markets is that, because the product jointly benefits two parties, there is no basis for separating benefits or costs."* (Evans 2002, 9).

143 Online startups often apply so-called 'tiered pricing', by which the customer chooses a service level. For example, level A gives *Y* features, and a paid level B gives *Y+n* features. As customers frequently switch between the service levels, the average lifetime value of a customer is a mixture of A and B; generally lower than price level B times the customer's lifetime.

144 The future will show if this is a temporary phenomenon, or a true change in business logic.

Indeed, to assume free is to assume commoditization. Although claimed by Anderson (2009), and followed by many startups, there is no definitive proof of the sustainability of the model, even more importantly of its necessity, if WTP and its association to differentiation strategies can be shown in the real world. In fact, it is observable that consumers *are* in fact paying for online content[145]. It is therefore not categorically true, at this point in time at least, that all industries converge to free.

The connection made by Bekkelund (2011) is therefore crucial as it implies that differentiation is a potential strategy against the monetization dilemma. In fact, Anderson's (2009) assumption of strict price elasticity abandons the use of marketing as a differentiating factor in both 1) communicating products and 2) acquiring information on the needs of customers to create differentiated products. Such a fallacy occurs when marketing is not perceived to contribute to price elasticity. As economists posit, advertising has the potential to create "artificial product differentiation" and change tastes (i.e., preferences), and, as a consequence, advertised products face less elastic demand, associated in theory with higher prices (Beuscart & Mellet 2009).

However, a static set of assumptions such as these can be countered by arguing that regardless of differentiation through marketing or product diversification, rivals are able to compete away these benefits rather quickly. Arroyo-Barrigüete et al. (2010, 644) argue that "*[winner-takes-all] does not mean, however, that competition is scarce; it is quite the opposite, in fact: the competition can be very intense until a company succeeds in establishing its technology as the dominant one*." Indeed, the inclusion of competitive dynamics is required; some aspects relating to this are further elaborated in Chapter 4.7.

Moreover, if offering a free product, the user base cannot be substituted indefinitely, so the problem culminates in decisions such as "which side to charge?" and "how much?" If the startup is able to create network value between two sides in the market, it should also internalize that value (Rochet & Tirole 2003). Therefore, depending on the platform firm's perspective, its pricing strategy has to, or can, consider network effects; that is, the indirect benefits derived by parties from interacting with one another.

Inherently, online markets seem to provide a fruitful ground for free offering, while making monetization difficult. According to Luchetta (2012), these can include 1) low technical and financial entry barriers, and 2) strong network externalities. While the latter premise is subject to specificities, such as markets and user behavior (e.g., multihoming), entry to online platform markets is inarguably easier than, for example, offering a shopping mall

[145] Refer to the annual reports of Zynga and Spotify for anecdotal but valid evidence on discarding a categorical rule.

platform. While this might increase *half-hearted efforts* and thereby lead to a naturally high mortality rate[146], it can also erode serious competitors' price levels. In particular, whether or not there are network effects does not, strictly speaking, matter.

Consider a founder who believes there are network effects to be achieved in a given market, and therefore sets prices *gratis* to obtain a critical mass before rivals. Whether users multihome or not, or how strongly network effects actually affect adoption, thus plays no role in the outcome; the startup will make free offerings. In a sense, network effects can be red herrings, and so the concept is a double-edged sword for a founder who fails to understand its implications.

It remains true, however, that theoretical support for critical mass is strong and it is widely regarded as the reason for subsidizing users: "*one way to do this to obtain a critical mass of users on one side of the market by giving them the service for free or even paying them to take it*" (Evans 2002, 50). At the same time, the fundamental notion is to refer to two-sided markets; however, the strategy only makes sense if the startup is able to recoup *loss leader investments* on the paying side. Rochet and Tirole (2005, 3) imply that the purpose of the two-sided market, in a commercial sense, is to charge total prices that cannot be negotiated away by participants: "*The platforms' fine design of the structure of variable and fixed charges is relevant only if the two sides do not negotiate away the corresponding usage and membership externalities*." Indeed, if the parties were able to negotiate the externalities, the market would be feasible. If introducing fees to either side would lead to a collapse, this would represent a "natural cause of death" because failure is a proper response to a lack of demand[147].

We can therefore differentiate 'true' or genuine demand from superficial demand, which is present only when offered free. This is similar to the case of giving away free beer. Such a business would obviously be successful on the first day, but if the next day or a few days later it introduces fees and none of the customers return, there might not be demand at the set price[148]. Applied in the context of online startups, if the price is zero and still there is no

[146] Given that Internet startups might require little sunk investments apart from learning, there is also a low *exit barrier*. In fact, exit is a positive strategy if the learning accumulated can be redeployed in another startup that is expected to succeed better.

[147] This remark relates to long-term scenarios; in the short term, firms might apply penetration pricing and other loss-leading tactics. However, in the long run, demand will determine the venture's viability.

[148] In other words, reducing price to zero can introduce pseudo-demand, which can be eliminated by any price rise.

attendance, this might imply there is no demand at *any* price[149]. However, a much more plausible explanation, based on the author's analysis, is that the startup simply lacks awareness to generate such feedback that would enable it to develop the platform in the correct direction, eventually gaining legitimacy. In any event, it is imperative that adoption is preceded by both price considerations and awareness (i.e., marketing).

The literature lends support to the idea that a lack of demand results in disappearing two-sided markets: "*an important characteristic of two-sided markets is that the demand on each side vanishes if there is no demand on the other-regardless of what the price is*" (Evans 2002, 50). At the same time, *superficial* demand is not considered as it is demand for the product, albeit in the "free beer" sense, and would vanish if fees were introduced. Inarguably, if both sides of the platform are unwilling to pay, it cannot be viable unless it is non-profit, public, or venture-funded.

In a similar vein, Tajirian (2005, 1) recognizes the efficiency of platforms in coordinating exchange, and therefore their newness, but still posits the platform should be able to extract rents from its services:

> *"[A platform] is more efficient in facilitating the exchange coordination than a bilateral relationship between buyers and sellers. Nevertheless, for the existence of an economically viable market, the marketplace must to be able to derive economic profits from facilitating the coordination by appropriately charging each side of an exchange."*

It might also be the case that there is demand, which the startup is unable to capture. This would be the case when the platform is too open and relies on users' goodwill to compensate it for its services. Given rationality, if users gain advantage (e.g., financial, time, or effort) in bypassing the platform at the transaction stage, while utilizing its services at the match-making stage, they will take this opportunity. Therefore, platforms that are unable to capture rents become easy free-riding targets. As noted by Roson (2005), the interaction between users might not always be perfectly observed, or it might only be a part of the interaction in the platform, while continuing elsewhere[150]. For example, match-making services such as dating sites only benefit while people

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[149] If there is lack of demand at any price, the lack of demand can be said to be genuine and there might be no need in the market for that product. In startup language, such a condition can be termed "vitamin syndrome", whereas highly demanded products would be "pain killers".

[150] Consider the author's personal experience of utilizing a freelancer platform to run an auction in the platform, and then contracting the developer outside the platform. In this case, the platform was not bypassed, as they charged a listing fee, but had their fee been commission on the transaction, the author would have been tempted to free-ride.

are searching for partners; after a match is made, users no longer need to utilize the service[151].

Paradoxically, the more efficient the platform is in providing matches, the less it earns if it is unable to capture rents. Moreover, even when it captures rents based on transactions, a relationship between users might develop that will bypass the platform in their future interaction of a similar kind (Rochet & Tirole 2005, 13): "*Buyers and suppliers may find each other and trade once on a B2B exchange, and then bypass the exchange altogether for future trade.*" Note that this observation is similar to the example given earlier of 'ActivityGifts vs. Gidsy'. In brief, private knowledge can become an issue. However, offering some slack on this condition can be appropriate if other UG effects on average compensate for the lost taxable interaction. Such would be the case when users still propagate the platform, give feedback, or assist other users; compensating for opportunistic behavior. In any case, it can be seen that the choices relating to a platform's openness (Eisenmann et al. 2009) can influence its ability to appropriate coordination services.

Moreover, there can be psychological aspects defending the free strategy; namely, introducing fees, any fees, might result in a disproportionate negative effect on users' willingness to adopt (WTA). Shampanier, Mazar, and Ariely (2007), for example, argue that the benefits of a free product are more highly appreciated than paid products, regardless of their difference in quality. This lends support to the idea of satisficing (Simon 1956), so that users fallback on free products if they provide at least a somewhat satisfactory solution to their problem (i.e., "get the job done"[152]), despite their inferior performance. This would indicate considerable friction in adopting paid platforms if substitutes are available, even if inferior. However, Pauwels and Weiss (2008) study a successful transition *from free to fee*, and conclude that a charge can be made for content, even when the theoretical reference price is zero.

However, even if not appreciated by users, fees might be indirectly important. As such, pricing can influence the quality of the user base that, in turn, influences the benefits users derive from the platforms. Thus, prices can have an indirect effect on increasing network effects, and pricing is an important connection as an adverse selection control mechanism (Akerlof 1970; Cennamo & Santalo 2013; Dushnitsky & Klueter 2011). Therefore, pricing can be regarded as a governance mechanism that filters out low-quality participants from the platform. Removing low-quality interaction that influences

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[151] In some cases, this poses a moral hazard for the platform. For example, Hagiu and Jullien (2011) discuss a price-comparison site's incentives to divert searchers toward more profitable products.

[152] Consider a mobile app for note-taking versus pen and paper. Clearly, they are not competitors in the application marketplace. However, from a user's perspective, they can be substitutes. In this sense, substitutes and indirect competition can be similar (see Chen, Esteban, & Shum 2008).

perceived network effects is critical, and can increase user satisfaction, loyalty, and finally, the basis for rent capturing. Prices can also signify quality to users; consider the abundance of free services, and the problem of determining quality in the absence of prices[153].

In particular, low-quality users might generate negative cross-group externalities that would harm the other group of users. This can occur regardless of which side is being charged. For example, too much low-quality advertising on Facebook might turn users to different social platforms, whereas low-quality visitors resulting from Facebook advertising might turn advertisers to other platforms such as Google's AdWords[154]. Therefore, the lack of pricing (i.e., two-way free access) can lead to a situation of adverse selection, which is detrimental to the survival of the platform. There are two important issues here: first, in a freemium model, is there a spillover from free users to paid users so that the former might, under some circumstances, create negative externalities for the latter (e.g., congestion; use of support resources)? If this is the case, the freemium model risks adverse selection, as paid users become annoyed by the presence of free users.

Second, price is not the only mechanism with which to prevent adverse selection problems. For example, authentication through identity can reduce spam caused by anonymity. This was discovered by the popular technology blog TechCrunch; after introducing obligatory authentication through revealing identity when logging-in to Facebook, abusive comments decreased (Burns & Blesener 2013). The theory being that, in the presence of social penalties, people avoid abusive behavior when their identity is revealed, whereas anonymity enables such behavior. Some support for this notion can be found in Lea, Spears, and de Groot (2001). However, the latter is limited to the inherently low quality of maliciousness, whereas quality problems can arise regardless of malicious intent (see the earlier discussion in Chapter 4.5).

Sides can also be considered as separate markets so that, for example, there are both developer and consumer markets. As such, the competitive dynamics can result in interesting findings. For example, Chakravorti and Roson (2006) consider a situation in which there are two competing platforms, *A* and *B*, that compete over two market sides, *x* and *y*. They show that a price decrease by platform *A* in one side of the market (*x*), apart from competition, will lead to a

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[153] Note that with the lack of prices, the startup omits revenue from its measures of success. If growth of revenue is replaced by growth of user base, the startup replaces customers with users as a proxy for success, and therefore commits to a fallacy of false popularity (see Chapter 3.4 for *users and customers*). Briefly, as users do not reveal a product's economic viability, or genuine demand, their use as a decision criterion can give incorrect information on where to allocate resources.

[154] This example is not only hypothetical. In the online advertising industry, it is commonly acknowledged that Facebook ads are of lower quality than search advertisements on Google. As a result, Google's advertising revenue was ten times larger than Facebook's in 2011.

price increase in the opposite side (*y*). This is the basic notion of subsidization (Rochet & Tirole, 2003). However, in a competitive setting, platform B will respond by reverse action; that is, by increasing the price of *x* to capture that market, and lowering it for *y* to regain losses. This is shown in Table 23, which depicts the platforms' strategic choices.

Table 23 Strategic pricing (adapted from Chakravorti & Roson 2006)

	Platform A	**Platform B**
Side x	Lower prices	Raise prices
Side y	Raise prices	Lower prices

Consequently, lowering the price for side *x* will gain relative advantage over the other platform in that segment, and *vice versa*, and acquiring market share there will attract more users to side *y*, which can be taxed based on the network value provided by side *x*. Note that this assumes side *x* is willing to pay; it might be that introducing fees offset the perceived network value.

The major contribution of the literature is that the two sides of the market are interconnected, and that the startup might produce a loss on one side. This principle is paraphrased by Parker & Van Alstyne (2005, 1498):

> *"If the increment to profit on one complementary good exceeds the lost profit on the other good, then a discount or even subsidy becomes profit maximizing. Free-goods markets can therefore exist whenever the profit-maximizing price of zero or less generates cross-market network externality benefits greater than intramarket losses."*

However, in terms of monetization, this is not much help. Farrell and Klemperer (2007, 2020) provide a more useful approach: "*It is efficient to subsidize a marginal adopter for whom the cost of service exceeds his private willingness to pay, but exceeds it by less than the increase in other adopters' value*." This effectively implies, transferred to the monetization context, that subsidization can be a profitable strategy while the price paid by premium users exceeds the overall subsidization cost for free users, including acquisition, serving, and support. Equally, the same applies for as long as advertising revenue, when monetizing through adverts, exceeds the subsidies.

Finally, it is relevant to draw an analogy to dotcom failures as some arguments presented here exhibit similar features to those made at the time. Essentially, in the dotcom era (ca. 1999-2001), two-sided markets were known as electronic marketplaces. Most of the literature addresses the failure of B2B marketplaces with, arguably, a similar conclusion to that regarding the B2C

context, given that the platforms have similar dynamics. Some of the failure factors included, for example, 1) lack of quality indication, so that buyers could not distinguish between reputable and non-reputable sellers, 2) excessive competition on price among platform supply-side participants, 3) brand dilution, and 4) existing industry relationship (Evans 2009a). Describing the hype at the time, Evans (*ibid*., 115) states:

> *"Various researchers forecasted that B2Bs would come to account for a large fraction of commerce. Goldman Sachs predicted in 2000 that B2B e-commerce transactions would equal $4.5 trillion worldwide by 2005. […] Entrepreneurs and venture capitalists poured into this new industry. Between 1995 and 2001 there were more than 1,500 B2B sites.[…] Most of them collapsed in the early 2000s as investors realized that they did not have a viable business model and as the expected buyers and sellers failed to turn up.*" (Present author's emphasis)

Therefore, unrealistic business expectations of the new economy are posited as a reason for the demise of the dotcom era. The argument, based on an analogy between dotcom e-marketplaces, which arguably displayed similar characteristics such as multi-sidedness, and modern online platforms is that free offerings should be monetized, otherwise modern startups will share a fate similar to dotcoms.

However, if the company's goal is not sustainability but acquisition, the strategic choice of freefying can be better understood. It can be seen that the platform sacrifices profitability, even in the long term, as an attempt to raise interest from investors and larger companies, and then to monetize the, albeit hyped, interest. If this is the goal then profit is secondary to liquidity, as noted by Brunn, Jensen, and Skovgaard (2002).

The analogy to dotcoms is somewhat alarming as the key tenets for failure, based on both the sample and the theoretical survey, still very much surround online markets. It has been argued that the nature of information goods, with a low marginal distribution cost, or the nature of two-sided markets are insufficient for free offerings *per se*, and require a realistic plan to monetize. It seems that the literature shows mixed approaches, and cannot debunk or positively confirm the premises made in the definition of the dilemma. Therefore, it is fair to argue that the dilemma endures quite a multi-faceted treatment. Next, a potential solution, the freemium model, is considered.

4.6.3 Solution: Freemium

When one side is subsidized (refer to Subchapter 4.4.3), the startup is forced to find a party that is willing to pay for the demand-side's use of the product, which is termed *indirect monetization*. When the monetization model is freemium, the startup has one user base that is split into free and paid users, and the model is direct monetization, with price discrimination. Free users are offered the basic service while paid customers receive extra features, quota, or support (Pujol, 2010). Freemium is a widespread model in the context of Web startups, as noted by, for example, Niculescu and Wu (2010) and Teece (2010). Therefore, it is suitable to consider freemium a potential solution to the monetization dilemma[155].

According to Wilson (2006), freemium is defined as follows:

> *"Give your service away for free, possibly ad supported but maybe not, acquire a lot of customers very efficiently through word of mouth, referral networks, organic search marketing, etc., then offer premium priced value added services or an enhanced version of your service to your customer base."*

The definition can differ based on the type of platform. For example, Riggins (2003, 70) considers content platforms: "*What these information providers are essentially doing is degrading their information product to create a free version of the good that satisfies low-type consumers, but holding back enough content so that high-type consumers are not entirely satisfied and, therefore, are willing to pay for the fee-based site.*" Riggins divides users into low- and high types based on their WTP; however, he does not consider that users can move from one side to the other (i.e., downgrade or upgrade). Freemium can also be regarded as second-degree price discrimination or versioning (Varian 1983), whereby users are given a choice between low-quality and high-quality products[156]. Note that the equivalents are free and paid product in the freemium setting, and that the quality does not refer to "bad" quality but, for example, that the other product has less features. The low quality still has to be sufficiently substantial to invite adoption, as discussed previously.

Beuscart and Mellet (2009) suggests that although Internet platforms categorically give free access, they are able to monetize through four means: 1) advertising (e.g., Facebook), 2) freemium (e.g., Evernote), 3) transaction fees (e.g., eBay), and 4) donations (e.g., Wikipedia). Donations apply to

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[155] In general, any solution that either directly or indirectly increases WTP (i.e., converting from free to paid users) is effective.

[156] In contrast, first-degree price discrimination occurs when the startup is able to identify WTP, and therefore targets users with precise products. In second-degree discrimination, users are presented with both options, and they can self-select (Riggins 2003).

non-profit projects rather than commercial ventures, and are not considered here[157]. Advertising is a form of indirect monetization; thus, it effectively circumvents WTP. As WTP is made irrelevant, the problem can be solved by finding advertisers that are willing to pay for access to users. However, advertising is not generally considered a good option, unless the platform generates a substantial mass of traffic; therefore, it is a winner's choice in a winner-takes-all market.

Riggins (2003, 81) notes that "*sponsored sites have struggled to find a profitable business model based on advertising revenues.*" The performance of advertising is also criticized by Beuscart and Mellet (2009, 165), who describe advertising revenues of Web 2.0 companies as "*weak and disappointing, especially related to their audience*"[158]. Advertisers often seek economies of scale that an early-stage platform is unable to provide and, due to transaction costs, it does not make sense for them to contract a large number of weak platforms.[159] A negative position is also taken by Clemons (2009) who concludes that advertising will eventually fail as the primary business model because it is distractive, consumers do not trust it, and its informative capability is being replaced by recommendation platforms.

Additionally, transaction fees are a form of direct monetization and therefore beyond the assumptions of the monetization dilemma. If transaction fees were applied successfully, there would be no problem with monetization, given sufficient liquidity; however, contrary to the hypotheses, this is not the case in the monetization dilemma[160]. In contrast, freemium aims to *overcome* WTP by a form of second-degree price discrimination. This differs from 'bait and switch' in that a startup does not normally change the price levels after users join, but expects usage to grow naturally and, therefore, free users to convert to paid users (i.e., customers)[161]. As a solution, freemium relies on its ability to change negative WTP into positive WTP.

As noted, freemium is not the same as subsidization, in which, according to the two-sided markets theory, it is assumed that two sides interact. In

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[157] There are initiatives (e.g., a startup termed *Flattr*) that propose voluntary micro-payments (i.e., a form of donations) in exchange for the consumption of content. However, they have not reached the mainstream at this point in time.

[158] Google is a notable exception; its revenue, mostly from advertising, amounted to $50Bn in 2012 (Google Inc. Announces Fourth Quarter and Fiscal Year 2012 Results 2013).

[159] However, any type of platform can access the advertising market though online advertising networks (see Salminen 2010), which largely reduce transaction costs for both parties in finding, negotiating, and monitoring performance of their counterparty. In exchange, advertising platforms take a commission based on some revenue sharing principles; typically, the publisher, that is the connecting platform, retains the majority of click-based revenues.

[160] Moreover, *transaction* as a term only applies to exchange platforms.

[161] In contrast, it might increase features over time; however, the free version typically remains an option.

freemium, there is no such assumption; instead, users form *a priori* one homogenous group, and then self-select into 'free' and 'premium' groups. Even if this results in two groups of users (i.e., free and paid users), these groups derive no immediate benefit from each other's presence[162]. Although the goal of *growing the user base* can be shared by a two-sided market in general and a startup applying a freemium model, the difference is that free subsidization in a two-sided market aims to provide positive network effects for another side of the market, whereas freemium attracts free users who can later be converted to paid customers. However, in a *one*-sided market, freemium can be regarded as a type of subsidy. As such, it is similar to differentiation[163] and versioning[164].

There is support for the idea of converting free users to paying customers. Traditionally, marketers have employed *sampling* to penetrate a market, so that giving free samples converts users into loyal customers (e.g., Milgrom & Roberts 1986). Peitz and Waelbroeck (2006, 907) argue that, as a result of sampling, consumers are willing to pay more "*because the match between product characteristics and buyers' tastes is improved*". This is especially true for Web services that are similar experience goods, so that consumers need to try before they buy because quality is difficult to determine prior to testing (Shapiro, 1983). As noted by Niculescu and Wu (2013, 2), "*[b]y trying (sampling) the product or part of it before committing to any purchase, consumers could learn more about the quality and other attributes (such as performance, functionality, interface, and features) of the software, capabilities of related modules, compatibility issues, hardware requirements, etc.*" However, in contrast to physical goods, with which sampling is limited due to replication and distribution costs (Niculescu & Wu 2013), freemium benefits from information goods properties (see Subchapter 4.6.2), and therefore scales much better.

Moreover, there can be positive spillover effects relating to free users. For example, Oestreicher-Singer and Zalmanson (2009) found that social features built alongside content interaction increases the propensity to convert to a free user, so that the more active users of social features were also more likely to convert. This suggests a relationship between content interaction and social interaction; that is, spillover effects between them. Potentially, particular types of platform might benefit from building structures that support other types of interaction; for example, exchange platforms compatible with sharing and content platforms that enable exchange. In a similar vein, Albuquerque et al.

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162 However, free users can derive long-term benefits, as shown in Chapter 4.4.1.
163 Creating features that make the product special in the eyes of users.
164 Creating several versions of the product.

(2012, 408) found that free users' content creation activities led to increased profits of the user-generated platform they studied, whereby "*free marketing activities and referrals bring in about 50% of the sales of the platform, and we suggest that [the company] should provide additional incentives to content creators to increase their referral behavior*." Although, in general, this study advises against overly optimistic expectations concerning the role of peer marketing, they seem to prevail in some circumstances.

Platform theorists have employed the concept of differentiation to explain the coexistence of several platforms in a given market. For example, Tanriverdi and Lee (2008, 382) note that "*heterogeneity in customer preferences allows differentiation, limits market tipping, and leads to the coexistence of multiple [OS] platforms*." It is seen that users might require different feature sets. This enables platforms to attract different types of user within the same markets, which relates to the assumption that while network effects hold within a group, they might not generalize (see Subchapter 4.5.1). Cennamo and Santalo (2013) refer to distinctive positioning in inter-platform competition, which means that the differentiating features and target markets depend on the choices of other platforms. Over-differentiation can result in a niche trap, whereby the mass-market provider is ultimately also able to capture the niche users (cf. tipping; Farrell & Klemperer 2007). Applied to freemium, the startup can create features that are distinct from other platforms while maintaining the same minimum requirements set by the competition. Such an approach aims to simultaneously maintain differentiation while appealing to users' standard expectations.

However, there are some limitations to freemium. First, Oestreicher-Singer and Zalmanson (2009, 2) note that "*conversion rates vary and are often very low, and firms continue to seek effective strategies for converting consumers 'from free to fee'*." Indeed, many authors note the 'expectancy of free' by customers (see Subchapter 4.6.2), thus complicating reversion to paid offerings. There are also varying accounts on how easy it is to convert free users to paid customers; Murphy (2011) notes that industry averages are approximately three to five percent of conversion rates. This study will not consider the tactical methods of conversion optimization; however, based on the author's experience, it can be noted that a substantial amount of time and effort is spent by startups on optimizing their conversion rates. In particular, Pauwels and Weiss (2008) highlight, among other factors, the importance of 1) the correct price point, given the competition, 2) accumulating a substantial base of free users before attempting conversion-enhancing actions, and 3) properly executed marketing communications.

Second, based on an extensive sample of users of the freemium-based website Last.fm that is classified as a content platform, Oestreicher-Singer and

Zalmanson (2009, 19) found that that it took 652 days on average for a free user to convert to a paid user. They concluded that "*the typical subscription decision […] requires deep familiarity with the website and its features*." Therefore, even when the conversion might take place from free to paid, the process can be long and require consistent persuasion (i.e., marketing) by the startup. Then, the startup needs to consider supporting costs for the free users during their free period (Subchapter 4.6.2), to find which user types are more likely to convert, and to create potential tactics to facilitate earlier rather than later conversion.

Third, Bakos and Katsamakas (2008) examine the optimal platform design structure and conclude that a platform would be advantaged by focusing on one side, and then charging that side. By applying this logic to freemium, this would mean that the startup should serve paid users better than free users. Although this is achieved with premium features that offer higher quality (i.e., more features), the free version needs to be able to solve the cold start problem. Under freemium, platform design issues therefore concentrate on choosing the appropriate structure for product variations and 'tiering' (Semenzin, Meulendijks, Seele, Wagner, & Brinkkemper 2012). Such design choices require a tradeoff, whereby the platform needs to determine what is sufficient to include in the free version to attract free users while keeping paid users satisfied.

This is known as the *cannibalization problem* (e.g., Riggins 2003), which has been studied extensively in the extant literature. Generally, a firm facing the problem must balance its allocations so that customers do not have an incentive to fall back to their second-best choice (see Subchapter 4.6.1). However, not offering a free version might leave the cold start problem unresolved (Subchapter 4.4.3). As offering a free version to some users is a strong form of subsidization and creates the cannibalization problem, the startup needs to balance this with sufficient investments to paid users, or risk "*spillovers from the intermediary's investments in the other side of the network*" (Bakos & Katsamakas 2008, 192). The spillovers would be, for example, overly generous features or usage quotas, depending on the type of premium constraints enforced, which would reduce the incentive for paid users to stay on the paid user side or free users converting to paid customers, when this would otherwise be required by the stricter conditions.

Pujol (2010, 2) refers to the cannibalization problem as the reflective competition dilemma: "*Feature differentiation can be challenging as it requires tradeoffs between growing the free user base and generating revenues, [i.e.,] the reflective competition dilemma.*" Riggins (2003, 70) describes the problem as follows: "*For two-tier sites […], the challenge is to provide enough free content to keep users coming back in order to increase banner ad*

revenues, but, at the same time, limit the free content such that high-end users will still be willing to pay to access the premium services and information." Moreover, Riggins (2003) assumes that advertising is a sort of control mechanism, so that it can be utilized by a platform to increase inconvenience up to the point at which users are willing to convert. In a pure freemium strategy, this option does not exist. The problem is also perceived by practitioners (Chen 2009): "*the key is to create the right mix of features to segment out the people who are willing to pay, but without alienating the users who make up your free audience.*" For the sake of clarity, the problem can be conceptualized in this study as the *feature definition problem* in the specific context of the freemium business model[165]. This conceptualization captures the freemium business model as opposed to, for example, advertising, and refers to measures that need to be considered by the startup when designing its offering.

Bekkelund (2011, 16) argues the use of "*observable characteristics, such as memberships in particular social or demographic groups; or unobservable characteristics, such as the quality of the choice the consumer purchases*". These are needed because the WTP is not known to the startup in second-degree price discrimination (Riggins 2003). Bekkelund (2011) notes that freemium enables startups to experiment with pricing plans to discover users' true WTP, which is compatible with Ries' (2010) proposal. Consequently, by identifying common characteristics of users who are willing to pay, the startup might be able to move to first-degree price discrimination, in which it would directly offer discriminatory pricing plans based on WTP (Laffont, Rey, & Tirole 1998).

In other words, a potential move for startups is to find a proper niche to target. In saturated markets, it is generally more challenging to discover needs that other platforms have not satisfied (cf. Parrish, Cassill, & Oxenham 2006). To speculate whether, and to what extent, online markets have become saturated or not goes beyond the scope of this study; however, generally, given the low cost of experimenting with different platform models, many mass markets tend to be difficult for challengers. Nevertheless, by employing different factors as differentiation criteria (e.g., geographic location; language; highly specific interests), startups might be able to create niche platforms that are able to reach a critical mass for both self-propagation and active use.

Teece (2010, 178) mentions that it is also possible to apply a hybrid strategy and puts forward Flickr as an example: "*Flickr's multiple revenue stream business model involves collecting subscription fees, charging*

[165] The problem relates to two conflicting incentives: 1) when giving free content, paid users might be willing to downgrade, and 2), when only offering paid content, users who would convert after a trial period will not adopt the platform.

advertisers for contextual advertising, and receiving sponsorship and revenue-sharing fees from partnerships with retail chains and complementary photo service companies." Several methods can therefore be applied alongside freemium. As also mentioned by Riggins (2003), the platform can utilize negative network effects associated with advertising to drive up the number of users' willingness to convert. However, such a strategy is risky because users might also switch instead of converting. Thus, utilizing *advertising as a threat* might not be an effective tactic.

In sum, freemium is a way to split users into free and paid users. It is similar to, although distinct from, bait and switch. The startup does not expect users to pay for the initial adoption but, as their usage grows, they are offered extra paid service. As such, the functionality of the method as a solution is directly linked to the proportion of free and paid users. If the paid user base is sufficiently significant to sustain free users and satisfy the startup's financial goals, the solution is successful. However, more research is needed to understand the antecedents to conditions in which users can be made to convert. This relates to emerging studies on *conversion optimization* (see e.g., Jankowski 2013; Paden 2011; Soonsawad 2013). For example, Pauwels and Weiss (2008) document that their case company employed e-mail marketing and price promotions to upsell content subscriptions to their base of free users.

4.6.4 Discussion

By offering access and usage of its platform for free (i.e., *freefying*), a startup is able to attract users, but is unable to monetize (i.e., attract paid customers). If monetized, users opt for free substitutes. Therefore, should a startup aim for free users or charge for its product? How valuable are "users" actually? How to capitalize on popularity? These are questions that arise from this dilemma.

In essence, the literature shows two camps. The first argues that free models are fundamentally different from the old rules of doing business (i.e., a new economy), whereas the other argues for "business laws" such as revenue, viability, and sustainability. The strong analogy to dotcoms cannot be ignored in this debate as there is a risk of history repeating itself.

By applying the freemium model to a product startup (e.g., one selling a uniform product to all customers), it can be transformed into a two-sided setting (see Chapter 6.1). This is because the startup's user base can now be divided into two groups, which is a condition for platforms, of free users (i.e., users) and paid users (i.e., customers). The question of the analysis then becomes: are there network effects between these groups? At first sight, the answer is "No", as the product qualities do not change for paid users regardless

of the number or quality of free users, or *vice versa*. However, it can be argued that the free users gain long-term benefits from paid users as this guarantees their free usage. Ultimately, if the startup is unable to attract a sufficient number of paid users, it will close down, and both free and paid users will lose. If free users are aware of this, they might become motivated to promote the platform to their peers in the hope of converting some to paid users.

However, although free users gain benefit from the existence of paid users, it is unclear whether paid users benefit from the existence of free users. If not, the network effect is asymmetric: one side benefits more than the other. In fact, this is not necessarily uncommon in online business. Consider advertisers and free users (i.e., consumers of content); advertisers, in theory[166], benefit from the presence of users, and would not engage with a platform without them. However, the reverse does not apply, and users would in most cases happily frequent the platform without advertisers[167]. This condition, as previously stated, is a negative indirect network effect, and it is not clear whether it exists between free and paid users (e.g., through congestion). While it is often assumed that the marginal cost of distributing a digital product is "close to zero", if the startup invests its resources in acquiring free users, the overall user acquisition cost is transferred to prices that paid users will ultimately pay[168]. In other words, there is a potential free rider problem.

This is, in fact, well understood in the platform literature as it is perceived *fait accompli* that one side is being subsidized by charging the other. To the author's knowledge, this only becomes an issue in two cases: first, when assuming ideal user generation (UG); in other words, when the startup expects a positive non-economic contribution from free users, such as peer marketing. According to the study's analysis, there are startups that make this assumption at least implicitly. The second case, in which free riding is problematic, is when paid users are tempted to join free riders, and leave the cost to a decreasing group of paid users, or when they avoid conversion in the first place.

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166 It is important to note here that the relationship between the number of users and advertisers' increased utility (i.e., the network effect relationship) is not necessarily linear. From an advertiser's perspective, much attention is paid to whether users 1) are from the proper target group, whether defined by demographics of interests, and 2) that they are actively processing advertisements or, more preferably, clicking them. Furthermore, while clicks are relatively easy to track, banner blindness (Benway & Lane 1999) complicates the processing of online advertising, and therefore can be a major obstacle in the relationship of user base versus its worth to well-informed advertisers.

167 We can, therefore, argue for an implicit contract between the platform and its free users: users accept advertisers in exchange for free content.

168 Consider, for example, that the startup pays 100 money units to acquire 100 users, of which 5 convert (i.e., shift from free to paid user). Assuming that acquisition costs are evenly distributed (i.e., acquiring each user costs 1 money unit), and that acquisition costs are transferred to prices, which they will be in the long run according to economic rationality, the 100 money units will thus be added to the total cost of the product that will be paid by the 5 converted users; therefore, each will pay 19 more money units than without free users: (100-5)/5=19.

This type of strategic behavior can occur, for example, when users reduce their usage on purpose to avoid quotas; that is, where premium features are linked to consumption[169]. In sum, freemium can have negative spillover effects on conversion that restrict its use as a solution to the monetization dilemma.

Clearly, freemium and advertising can be combined so that free users, and not paid users, are shown advertisements. As advertising can represent a negative indirect network effect for free users, some would convert to paid users to avoid advertisements. In theory, this would provide the startup with two benefits: 1) revenue from advertisers, and 2) a higher conversion rate from 'free to paid' than otherwise would have been the case. The problem with advertising, by applying the platform literature, is simply that the startup needs to be a critical mass of users, impressions, or clicks to attract advertisers; otherwise, there are no network effects. This critical mass can be considerably larger than some startups assume, as those in the advertising side of the market are only willing to reduce their transaction costs by dealing with the largest platforms. Moreover, advertising can result in switching instead of conversion if users are *ad-sensitive*.

A more advanced tactic is not to employ indirect monetization at all but, instead, leverage the actions of free users in a frictional non-user-generated manner, to increase the conversion rate from free to paid users. This is identical to creating positive direct network effects. For example, the startup can gather the usage of free users as "templates" and offer them to paid users as complements. Therefore, the network benefits will only be available to premium side users, which would be an incentive for free users to convert to paid customers[170]. Because the generation of such content is 'frictionless', it is free from the free rider dilemma depicted earlier.

If freefying (i.e., offering a free access and usage) is applied as an *ex ante* solution for the cold start dilemma in an attempt to increase the adoption rate, turning from freemium to paid access is an *ex post* solution to the monetization dilemma. For example, some content portals have begun introducing pay walls for access to content (Spulber 2010). It is still too early to judge the results of these attempts; nevertheless, the publishing industry is facing strong pressure to monetize free content. This highlights the dynamic interaction, or vicious cycle, between dilemmas; that is, if fees are introduced, solving the cold start dilemma might become more difficult, whereas if

[169] Note that the definition of the freemium model applied here is based on versioning and tiered pricing (i.e., where free is the base level) not, for example, on time limitations. Although some authors include this as a variation of freemium, trial software stems from desktop software and does not offer a permanent free version as offered by the pure freemium model.

[170] In other words, the free side would be neutral to network effects but the standalone benefit would be the same, regardless of how many users are in the paid side, which is an interesting juxtaposition whereby the product simultaneously exhibits and does not exhibit network effects.

freefying is applied, monetization becomes more difficult. As in most cases, the startup is seemingly forced to make a tradeoff between the strategies.

However, opting for a paid monetization model might serve as a *stress test* for quick failure. If no users are willing to pay for a product, even after becoming aware of it, perhaps there is no true demand. Offering for free is equivalent to offering free beer; if it succeeds and the idea is later to charge for beer, there is no guarantee that the business will be sustainable once fees are introduced. Of course, this does not apply to indirect business models, although these might face the issues discussed previously in this chapter. In addition, freefying makes it impossible for the startup to compensate its content creators. Although this is not a major concern for a process of UG with motives deviating from economic rationality, it can become an issue in special cases. For example, one startup in the sample aimed to market journalists' writings, essentially relying on them to write for free, thereby commoditizing the labor they were paid to perform in traditional industry.

Competition with free can become hazardous in an industry setting with low distribution and entry costs, such as many online markets, because entrants are 1) many, causing increased pressure for subsidization across verticals, and 2) able to subsidize one side on the expectation of an emerging second side *ex post* (cf. finding a business model), and because this is facilitated by their cost structure. Eventually, this strategy can lead to a *race to the bottom*, whereby all platforms subsidize some sides by lowering prices, resulting in all markets becoming subsidized. In the medium term, the startup might be able to cover the loss of subsidization through venture capital, in the hope of either finding a side *y* to tax, if all of its users are initially *x*, or converting users from the subsidized side to the paid side, if they apply the freemium model. The situation will be resolved when entrants are unable to recoup their losses and exit both markets, which will enable the remaining platforms to adjust their prices upward and become profitable.

The conditions for a race to the bottom include the *ex ante* undefined side y, if side *x* is subsidized, and *vice versa*, and also the allowance period of expectations (e.g., hype) that enables new entrants to consume previously profitable sides (i.e., markets). As the required initial investments are generally low in the Internet, venture capitalists might favor disruption by sponsoring ventures that offer free substitutes to previously paid product categories to gain quick traction, and then sell these ventures based on the expected value of their user base.

The monetization dilemma is connected to the cold start dilemma; a startup is unable to subsidize users or pay for content if it employs a free business model. Hence, external funding is needed. However, startups without external funding might simply neglect paid actions, such as marketing, that would

facilitate solving the cold start or lonely user dilemma and thus, are unable to test whether the product would gain a critical mass[171]. This can lead to failure without even getting a chance. Thus, the solution of free models can lead to far-reaching consequences with regard to other startup dilemmas.

Regardless of the increased interest in monetization problems, the conclusions seem to be mixed. One side of the argument seems to *defend* the use and viability of free models in platform markets, while the other side *contests* it. The two-sided nature of the market, and network effects associated with it, are critical to this discussion. Pricing decisions (i.e., level and structure) in two-sided markets are distinct from those in one-sided market considerations. Therefore, subsidizing free users can be defended as a strategy, as rents can, in theory, be extracted from the other side with higher WTP. However, the marginal distribution cost (e.g., nearly zero in information goods) is too loose a definition, as it misses this subsidization cost, and also, typically, the cost of supporting free users.

Essentially, a startup can suffer from hidden information if the platform is too open and enables parties to negotiate and transact on their own, which is a particular risk for exchange platforms that often need to retain control over transactions. For other platform types, interaction beyond the platform (i.e., bypassing the platform) is not a major issue unless users are transacting (e.g., dating sites). Social platforms and content platforms, which often apply an indirect monetization model, need to consider the negative indirect network effect imposed by advertising, although theory shows that the effect can be in both directions, and also its particular challenges in providing sufficient returns for long-term business viability. In particular, advertising is appropriate for platforms with strong dominance, so that they can create a sufficient number of impressions and clicks to attract advertisers. Although the problem can be alleviated by delegating negotiation and coordination to an advertising platform, the risk of returns remaining low exists for this monetization model.

4.7 Remora's curse

4.7.1 Definition and exhibits

> *The remora is a type of fish that attaches itself to a larger fish like a shark or even a boat. It rides along with its host and feeds on whatever comes by. The remora can also detach from its host, swim on its own, and survive.* (Don Dodge)

[171] The classic marketing maxim: if customers don't know about the product, how can they buy it?

As established in Chapter 4.4, startups can face greater than expected difficulties in achieving a sufficient degree of user-generated content (UGC); "sufficient" being enough to launch a self-sustaining process of content replication, or a critical mass. To overcome this hurdle, some startups opt for the *remora strategy*, which is to join an existing platform to gain access to its predominant user base or content, and in this way solve the cold start dilemma. In practice, this might mean developing applications on top of existing platforms, such as Facebook, Google, or Twitter, and leveraging their application programming interfaces (API)[172] and user bases; essentially, gaining access to network effects without generating a critical mass. The solution might appear solid in theory, and there are several cases in which it has worked well (e.g., acquisition[173] or direct monetization[174]); however, our sample of failed startups also showed its limitations (for exhibits, see Table 25). The purpose of this chapter is to analyze these limitations.

The dilemma of a remora's curse takes place when a platform entrant needs to decide whether to integrate a critical functionality relating to distribution, marketing, or monetization to a predominant platform at the cost of losing power in those areas, or to develop an independent solution at the cost of losing access to the platform host's pre-existing user base, content, distribution, monetization system, or any other asset to which the integration would grant access.

Consequently, remora's curse addresses the choice of either developing a product on top of existing platform (i.e., become a 'remora') or not (i.e., start an independent platform); the former gives access to a pre-existing user base or content while the latter requires that the user base or content be created separately without the "kick-off" provided by the host platform. In both choices, the startup pays a tradeoff cost, as depicted in Table 24.

[172] API, in the case of Web applications, enables access between applications; in platforms terms, interoperability.

[173] Instagram, for example, was built to be compatible with Facebook, and was acquired by Facebook for $1Bn in 2012 (Constine & Kutler 2012).

[174] Zynga, for example, charges the user for virtual goods sold on the Facebook platform, and generated revenue of $1.2Bn in 2012 (Zynga Inc. 2013).

Table 24 Remora's choice

	Join	**Not join**
Tradeoff	Lose power over technology, marketing, and monetization	Lose access to the pre-existing user base or content (i.e., cold star dilemma)

Therefore, by joining an existing platform[175] as a supply-side participant, a startup gains access to an existing user base or content but increases its dependency on the platform owner, thereby in effect trading off 1) *technology power,* 2) *marketing power,* and 3) *monetization power* to a) *the distribution function* and b) *the marketing function,* which are delegated to the host platform[176]. Technology power implies that the host influences the startup's technology choices, and the startup incurs initial integration costs and, whenever the host platform's specification changes, continuous adaptation costs. This can be regarded as a form of asset specificity, as discussed in the literature subchapter. Losing control over marketing and monetization refers, respectively, to the inability to differentiate via marketing, as the platform poses marketing restrictions, and the inability to choose a monetization model as this is imposed by the host. In effect, the startup will also forego customer relationships because it is the platform owner that retains customer information[177]. The host has more information on the users but it restricts sharing it due to 1) privacy concerns and 2) the competitive value of information. Capturing value is another conflict: while in the platform, a remora can never reach an outcome by which its revenue supersedes that of the host. This is theoretically impossible when the host imposes a revenue sharing scheme and blocks all other means of monetization[178].

Exhibits of remora's curse are presented in the following table.

[175] Such as Facebook, Google, and Twitter, or iOS, Android, and Windows mobile.

[176] Distribution is delegated as the startup's platform is accessed through the parent platform's interface. For the same reason, marketing is expected to be self-organizing as users will find the startup's product inside the host platform.

[177] This was a major concern for record labels considering distribution with iTunes, as Apple would hold customer information (i.e., customer relationship); eventually, Steve Jobs was able to convince them of the mutual benefit (Isaacson 2011).

[178] The revenue of a remora grows proportionally to the host's share; so that $a/b \rightarrow k(a/b)$, in which k = growth factor, a = host's share, b = remora's share; given that $a > b$ and $a + b = 1$.

Table 25 Exhibits of remora's curse

	Example
[1]	*"We exposed ourselves to a huge single point of failure called Facebook. I've ranted for years about how bad an idea it is for startups to be mobile-carrier dependent. In retrospect, there is no difference between Verizon Wireless and Facebook in this context. To succeed in that kind of environment requires any number of resources."* (Rafer 2009).
[2]	*"The killing blow was when Facebook changed its app platform to make things less spammy, and thus less viral. We were toast."* (Parr 2011a).
[3]	*"Predictably and reasonably, Facebook acted in their own interest rather than ours. Their Summer 2008 redesign supported Facebook's goals elegantly but hurt our publishers and us in ways that became clear just weeks after we'd raised another ~$2M."* (Rafer 2009).
[4]	*"We were doing some time-consuming processing on gathered data so there wasn't a big time buffer we could use. With each downtime (the website worked but with no actual data it didn't make much sense to use it anyway) we had to wait until a backlog was cleared. Chances were good that by this time we had another issue to deal with – a bug in the code, on of auction platform's changing the structure of their data, a simple hardware malfunction, or running out of disk space."* (Brodzinski 2009).
[5]	*"[Facebook] wasn't a perfect fit for the Nouncer services, but it still fit in with the overall strategy and philosophy. It also looked like an easy thing to do with a big marketing potential. The result was JabAbout, a Facebook application using the social graph to propagate short messages by following the friends-of-friends paths. JabAbout failed to build a user base and was eventually shutdown."* (Hammer 2008).
[6]	*"Mint's dependence on Yodlee apparently suppressed their acquisition interest among companies that knew Yodlee well (such as Microsoft, Yahoo, and Google); since we had developed our own technology for aggregation, we didn't have that particular problem, and in fact had some acquisition interest simply for the aggregator we'd built."* (Hedlund 2009).

The exhibits demonstrate remora's curse from several angles. First, a *technology lock-in* [1] indicates a situation in which continuous investments from the startup are required to keep its product up-to-date according to the technological specifications of the platform owner. This might limit the available technologies to some extent while increasing dependence on the host's technological choices. If the choices are not optimal for the startup's product, this will reduce its competitiveness. Further, changing functionality [2] requires the startup to react and organize its product development according to that of the platform owner, and it pays adaptation costs [4].

The bigger issue, however, is the lack of control with regard to the user base. At any time, the platform owner can restrict or deny the startup's access to users, justified as a change of service terms [3] or platform design [2]. Losing access to users may also occur due to a technical breakdown. In consequence, the solution to the chicken-and-egg problem dissolves [5].

Moreover, the platform sets rules for marketing over which a startup has little control. For example, the platform might give additional visibility to particular products and not others, thereby distributing competitive advantage. A startup can have little control over its visibility in the platform as it cannot

influence the rules[179], and in general advertising is not allowed[180]. Overall, these limitations may reduce investors' willingness to invest in a startup [6].

As noted, adaptation costs arise when the startup is dependent on the platform as a source of data. First, it has to build the product so as to be compatible with the platform. Second, it has to account for changes that might easily break the flow of data and, therefore, its own product. Third, the platform owner can restrict access to data, rendering the product useless. Coordination problems of this kind, therefore, relate to the functionality of the product, and apply especially to startups following the *aggregator* content model[181] whereby, in theory, the startup's product integrates into several host platforms to fetch data. This solves the cold start problem well as the fetched content will enable demand-side benefits; for example, the more websites indexed, the better the search engine, all else being equal.

By aggregating data from several websites, the startup might gain an *in praxis* a solution to the cold start problem. However, at the same time, it becomes dependent on these data sources; any change in which necessitates an adaptive response or the startup's platform loses its ability to function[182]. The more aggregated platforms (i.e., data sources), the higher the risk for coordination problems; however, the less the dependency on individual sources, as they become expendable in a large selection, and the more changes by platform owners, the higher the risk of coordination problems. Further, the startup is forced to constantly monitor the health of the third party data source. Note that aggregation is a special case when joining a platform; its purpose is not to acquire users directly (*as in*: host platform → startup's platform), but to provide benefit for, often, existing users by offering them content from other sources, or to utilize the content indirectly through social interaction spillovers or search-engine indexing, which can lead to website traffic.

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[179] However, if the platform is fair and the rules are transparent, the startup is able to increase its position by adapting to them and outperforming competitors. Equally in this case, it is not affecting the marketing variables set by the platform owner, but only adapting to them.

[180] To compensate for the lack of marketing tools provided by platform owners, some developers have created tools for peer marketing. In them, applications exchange users on a 'give one, receive one' basis; the revenue comes from selling a small portion of slots to advertisers.

[181] Assume that all websites in the world suddenly deny Google's access to their content; the search engine would instantly become worthless. As Google provides indirect network benefits (i.e., a large number of searchers) this is unlikely to happen. Further, Google is inherently hedging its risk by diversifying the aggregation to billions of sites; therefore, its dependence on an individual host approaches zero.

[182] A real-time service loses matching ability; a static platform becomes outdated.

Consider two “degrees” of integration:

- **Full integration:** building the product inside the host platform (i.e., turning to a full complement).
- **Selective integration:** accessing the host platform’s functions and user base but retaining, for example, distribution and marketing[183]. These types of service are sometimes termed ‘mashups’.

Due to its definition, remora’s curse applies to both degrees of integration. The severity of dependence might be less in full integration as user base and marketing freedom is retained. However, if the access provided by the host platform is critical for the functionality of the remora platform, as is assumed in the definition, the dependency is also critical.

Moreover, it is assumed that most users find products, including those offered by the startup, within the platform. That is, the remora retains beyond-platform marketing capabilities, although they are mostly irrelevant when distribution is delegated to the host. For example, currently, leaderboards and rankings are controlled by the host in most online platforms However, if this assumption was denied and the startup was able to successfully market so that users connect to the platform to find the product, the marketing dependence would be broken. This is not, however, a solution to the dilemma as the platform owner retains control of technology, distribution[184], and monetization. If revenue sharing works in favor of a startup *in praxis*, this does not remove the fact that, in theory, the host can change the terms; although, while there is competition for complements, a choice such as that would most likely result in inter-platform competition.

While any of the above functions are considered critical, removing them partially from the host’s control does not solve the dilemma. However, partial integration can be sufficient in solving the cold start dilemma; more precisely, the startup might be able to draw users from its host to an extent whereby it obtains a critical mass. Even if the host then exercises its power, this is not detrimental to the startup as it has already gained a critical mass and is now self-sustained.

The risks associated with delegation are presented in the following table.

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[183] In selective integration, delegated functions can be arbitrary based on functionalities offered by the host and the startup’s strategy.

[184] Even in selective or partial integration, whereby distribution would not be delegated, the problem will persist while the host controls any of the critical functions.

Table 26 Risks of delegation

Delegated function	Risk
Technology	Technology lock-in
Marketing	Favoritism
Monetization	Unequal revenue sharing / no revenue sharing
Distribution	Breakdowns, changing terms

In a typical setting, the remora's expected benefit of joining relates to distribution. In aggregation, the product is distributed outside the platform, therefore with distribution and marketing costs, whereas the platform brings, in theory, delegation benefits. However, this matching, from the perspective of any startup other than the category leader, is not automatic, and herein lays the fallacy of believing that marketing investments are not required. In other words, intra-platform competition exists even in the presence of network effects, and due to the host's incentives to promote the strong remora at the expense of weak remoras, participating in a platform as opposed to being independent can in fact become detrimental; that is, the required cost for differentiation exceeds coordination benefits provided by the platform, which is easily perceived when understanding that *fair treatment* is not a profit-maximizing strategy of the host. Rather, it benefits from favoritism; particular killer apps bring much more revenue, and are much more difficult to replace, than the long tail of complements[185].

Consider, for example, a simple game with two players: remora and the host. Two versions will be presented: first, a version in which the remora is weak, meaning that the host does not believe it will sell. In the second, the remora is strong in the sense that the host believes in it and will give it additional marketing support (i.e., exposure). This is a sequential game with three turns: first, the remora decides whether to join or not; second, the host will either sell its product or not[186]; and third, the remora will decide to stay or leave.

The players make investments which they might lose, and gain benefits which they might keep. Sales are recurring (i.e., third round) and parties

[185] Consider App Store with millions of applications. The existence of this many complements is beneficial to the platform owner and also the end user, given that his search cost of having so much choice is not paramount, which is another reason for the platform owner to apply favoritism. However, the majority of developers are disadvantaged as their offering cannot be easily discovered (Salminen & Teixeira 2013).

[186] This simplification equals the remora's expected benefits described earlier; that is, acquiring users or content.

engage in revenue sharing. Network effects are assumed, as the following figure explains.

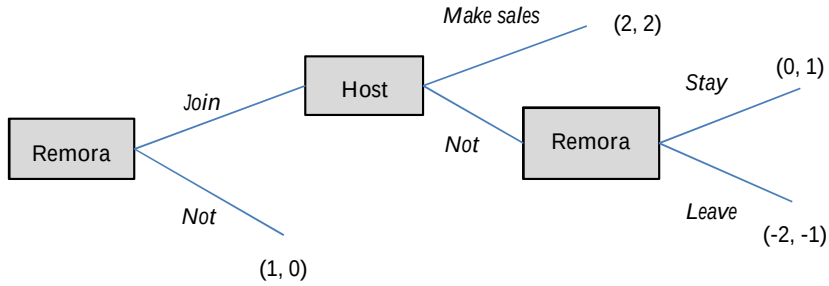

Figure 13 Weak remora

In the first stage, the payoff is expected benefits. As the remora will avoid marketing investments, such as advertising and hiring a marketing manager, it has a positive payoff. The product as a stand-alone would have some intrinsic value, but less than when combined with the host platform's assets (i.e., expected network effects). If the host makes sales, each party's payoff increases in proportion to that of the other party (i.e., revenue sharing[187]).

Not selling a weak remora's product gives a higher payoff to the host as it can keep the incremental network value without extra effort; comparatively, it incurs an opportunity cost of not selling the strong complement, which is why the payoff for not selling is higher than for selling. However, the host gets a positive payoff for the remora joining as the remora provides an increment to its complement base[188] (i.e., marginal network effect).

If the remora defects, it will lose its platform-specific investment. It will also need to redeploy its product and compensate for loss of marketing delegation, which is similar to the hold-up problem. However, it is assumed that the remora can recover some learning effects by redeploying the product either to independence or to another platform. Its departure will cause the host to lose the incremental value. If it stays, it incurs no additional cost, but can also resort to multihoming, which is not considered in the game.

At this point, keeping the remora will not produce additional gains for the host as it does not expect the remora to sell but to provide perceptible value. However, losing the remora would mean the loss of its incremental value.

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[187] For example, Apple shares revenue with its App Store developers using a *70/30 ratio*, in favor of developers (Gans 2012).

[188] According to the indirect network effects assumption, the complement base, as a whole, provides a sales argument for the demand-side users.

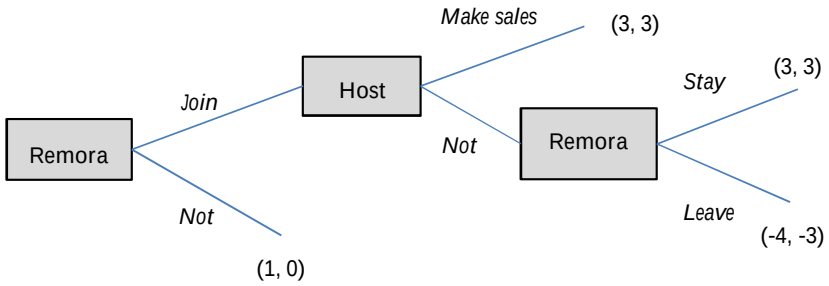

Figure 14 Strong remora

By joining, the strong remora gets the same expected delegation benefits as the weak one. At this point, it will only provide the incremental network utility. Not joining will also produce similar effects as in the case of a weak remora.

In this case, the host can make high sales and is incentivized to sell. If changing, the host would lose both the incremental network effect and the sales effect. The strong remora would lose its platform-specific investment and sales effect. Thus, both parties have an incentive to continue collaboration[189]. Here the demand-side user base (i.e., indirect network effects) becomes important for the strong remora; while, due to lack of exposure, theoretical network effects are important for the weak remora. Strong remoras actually realize high payoffs from participation.

Essentially, expected network effects are crucial with regard to the failure of a weak remora. While it provides an actual marginal increase as a network effect for the demand-side that the host can monetize, the weak remora gains nothing in return. For the weak remora, if it is a possible strategy, becoming strong before joining the host platform would provide a potentially better way of investing its resources than joining as a weak player. From the host's perspective, because payoffs are similar in the first step, it would need to distinguish between strong and weak remoras (i.e., "cherries and lemons").

For the host, intra-platform competition is often desirable; startups represent supply-side complements that increase demand-side utility[190]. For startups, the reverse can apply: the greater the competition, the more difficult it is to acquire users or customers, and the remora's marketing delegation advantage dissolves. The more the startup commits relationship-specific

[189] Alternatively, the strong remora might consider multihoming to several platforms, which is not considered in this game.

[190] The logic is such that greater selection increases customer benefit, a standard assumption of indirect network effects.

investments to the platform, the higher the degree of lock-in. In addition, motivation to join a platform might arise from the expectation that user acquisition is less costly within than outside the platform. However, when intra-platform competition is high, this is less likely to be the case because other startups and established firms compete over the same users. The competition can, in fact, lead to an outcome whereby user acquisition is equally, or more, costly than outside the platform[191]. As a result, the perceived marketing benefits relating to customer acquisition can dissolve, as demonstrated in Table 25 [5].

This implies that even if there is a potential market, and network effects apply so that the increase in end users is due theoretically to the startup, the startup is forced to compete within the platform. Therefore, these types of network effect are here referred to as 'theoretical network effects', which are theoretical (i.e., potential) as they do not realize under high intra-platform competition *unless* the startup is a category leader. In other words, the network effects are not shared equally; some participants enjoy them, while others, perhaps the majority, depending on the competition, do not. Therefore, network effects that do not take place in the real-world setting are worthless to the startup, and it gains no advantage in joining a platform with strong platform effects compared to the situation of starting a platform without a critical mass[192].

Furthermore, the remora strategy is distinct from utilizing a platform as a traditional marketing channel because of the integration of one or many critical functions into the host platform. For example, a user cannot access the startup's platform in a specific platform without first joining the host platform (i.e., full integration), or the user might not access it beyond the host platform if API access is not available (i.e., partial integration). If the host platform is a monopoly, then joining it might give the remora access to some monopoly benefits[193]. In contrast, when there is effective inter-platform competition whereby users are distributed between several competing platforms, it makes sense for the startup to follow this pattern by diversifying. While a subset of users will treat platforms as mutually exclusive and choose one among them, another subset will adopt several competing platforms simultaneously, regardless of interoperability. The platform literature respectively refers this to

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191 Such a situation is exacerbated when the platform owner reduces diffusion subsidies within the platform, thereby increasing friction between the startup and potential users; for example, when Facebook reduces visibility of application invites or organic post visibility in user streams.

192 Theoretically, the start-up gains a diminishingly small advantage compared to a pure cold start; although, the more competitive the market becomes, the more the start-up becomes a "long tail" provider. In brief, such a market exhibits winner-takes-all dynamics; however, *not* due to network effects but to favoritism and user preferences.

193 Such as user adoption, so that in the absence of alternatives, the host platform keeps growing the number of users.

singlehoming and multihoming (see Subchapter 4.7.3). By multihoming, in the supply side, the startup can gain access to both multihoming and single-homing users, given that the host platform does not require exclusivity. In contrast, choosing one host platform (i.e., single-homing) excludes users who single-home to a different platform than that chosen by the startup.

As the author has argued, under some circumstances, the expected benefits of the remora model do not materialize. If there is a reason for the startup to believe so *ex ante*, the dilemma dissolves as there is no rational reason to join. However, under no conditions will the potential power of the host be negated, regardless of whether it is enforced or not. The sole relaxation of the dilemma's validity from this side would be when integration only touches non-critical functions, but this is not in accordance with the definition presented here. The host choosing not to exercise its power is not a relaxation because, although it leads to a favorable position for the remora *in praxis*, the benefits are not stable as there is uncertainty concerning the host changing its strategy.

Another case is *take it all*, when the host is lazy in exercising its power in any of the critical dimensions. In such cases, the remora can in effect transform into a leech, gaining users while retaining all benefits. However, again note that the dilemma in effect persists as, at any time, the host can change the rules of the game. Twitter is a well-known industry example of a "lazy host" that grants free access, does not enforce revenue sharing, and is built as a very open communication platform with low lock-ins to the website. For example, Facebook has implemented strong lock-ins because users have to log in to its interface for each interaction, and are shown advertising; Twitter can be accessed from anywhere without realizing additional revenue[194]. Nevertheless, Twitter has also been known to break the rules of sound business logic in other areas, mainly monetization. In general, platforms expect reciprocity; even if not charging their complements, they expect them to provide indirect network effects that can be monetized according to their monetization model.

However, the loss of user base must be discussed; more precisely, the definition is 'users' not 'customers'. In other words, we return to the issue of 'user versus customer'. It is therefore possible to argue against the premises of the problem by stating that users are only desirable if they can be converted to revenue, because there is an implicit assumption that the startup wants users. In fact, this becomes an issue when the platform owner is possessive about the opportunities to monetize; for example, as is the case with Apple, but currently not Facebook, restricting available monetization methods. As such, assuming

[194] However, the behavior of platform complements is not "opportunistic", as they have no other choice. In opportunistic behavior, the startup chooses a strategy, among other strategies, which maximizes its profit at the platform host's cost. By this logic, Twitter is a "non-profit" platform, and should be excluded from commercial analyses.

indirect monetization is not possible, free users would not be worth the startup's efforts as the platform can internalize all complement benefits relating to monetization; that is, there is no revenue sharing.

In sum, remora's curse addresses situations in which platform participants are at the mercy of the platform owner, which often aims to control revenue sharing within the platform; for example, Apple's App Store dictates the revenue sharing terms for developers. However, the reverse might occur if the platform is open; that is, it enables free access to its data and does not control monetization. This case is clearly demonstrated by Twitter: for a long time, third party service providers tapped into tweets generated by Twitter without contributing anything in return; applying the animal analogy, the remoras had become leeches. These included services to monitor tweets, set alerts, and manage tweet streams. Counter-examples such as these do not remove the existence of the dilemma because Twitter can willingly exercise its power, which it has begun to do (Nickinson 2013).

The main risks of falling victim to the platform owner's strategic behavior can be attributed to platform design (i.e., rules, terms, and specifications) and unpredictable changes, in which central functionality is altered with no influence from the participants. Although joining an existing platform, or becoming a 'remora', might appear to be a *low hanging fruit*, or an easy solution to the cold start problem, the startup should be cautious about the potential hazards. As established in the introduction to this chapter, startups, as is the case with most organizations, are obliged to trade off strategic alternatives. Therefore, joining a platform is not a trivial matter as it can lead to strong lock-in effects and might be irreversible, especially considering the startup constraint of *limited runway* (i.e., depletion of time and resources).

Nevertheless, benefits of joining an existing platform probably exist in some form. It can be assumed that the advantages are strongest when the product category or industry is unfamiliar to potential customers, and therefore requires strong persuasion, market education, and heavy investments in promotional activities. However, each platform has its own competitive dynamics that might not always be fair and which can, in fact, lead to complete dissolution of the expected benefits. Although it might appear to be a good strategy for solving cold start problems, joining a platform does not automatically secure more customers due to intra-platform competition and the above-mentioned dynamics (Table 25). The platform owner's aim is, in most cases, to encourage competition among participants within its platform. An exception to this goal exists when protecting category leaders (i.e., *killer apps*) due to their higher benefit to the platform. In such cases, new entrants will have difficulty because incumbents are protected by the platform owner, for example, through

dominant ranks in application listings, thereby increasing the risk of a *winner take all* outcome.

4.7.2 The literature

This subchapter will examine the remora strategy from the perspective of the platform literature, which refers to remora-type structures as complements (Farrell & Klemperer 2007; Rochet & Tirole 2003); as such, becoming a remora is to become a complement. The problems derive from not having ownership of the platform, while the benefits originate from the existence of the host platform (i.e., coordination effects) and its end users (i.e., network effects). The large number of participants in the other side of the market increases attractiveness to join, whereas the platform's specialized coordination abilities increase matching to a point at which transaction costs of finding, negotiating, and monitoring the other side of the interaction can considerably decrease.

The platform owner's tendency to exercise power, and also the risks relating to the remora's position have been extensively discussed in both the platform and economic literatures; transaction cost-related concepts are especially applicable. In general, despite the fact that Internet startups did not even exist at the time of its invention, the classic hold-up problem (see Klein 1998) addresses this type of issue at a general level, although not necessarily from the same perspective[195].

More specifically, Hagiu and Yoffie (2009) identify three hold-up risks: 1) the host raising prices after becoming successful, 2) vertical integration into the remora's business, and 3) losing the ability to differentiate. Hagiu and Yoffie (*ibid*.) give respective examples: 1) after reaching dominance with Windows, Microsoft raised OEM licensing prices; 2) Google has been bundling applications into its core offerings; and 3) Toys 'R' Us was unable to differentiate against small players in Amazon's marketplace. In general, these risks are compatible with the concerns voiced by the founders (see Subchapter 4.7.1).

The platform owner becoming the startup's direct competitor is another risk. Due to asymmetric information in favor of the platform owner, it is able to monitor each product and decide whether or not to provide a substitute. Such examples have been documented in the industry (Honan 2012). However, as mentioned earlier, there are also documented success cases of

[195] The hold-up problem requires 1) asset-specificity, 2) incomplete contracts, and 3) incentive to "hold" (Klein 1998). In Web platforms, these arise if the complement cannot reuse its platform-specific investments. In general, no contractual agreements protect the complement, and the host can treat individual complements as expendable when they are large in number.

employing the remora strategy to rapidly acquire new customers (Campbell 2012), although, even in these cases, the power imbalance and, therefore, the dilemma is present (Kelly 2009).

Remora is a strategy that aims to internalize externalities of a larger network (i.e., envelopment). In platform markets, a remora relates to implications of compatibility. As opposed to competing technologies, especially rival standards, online platforms invite compatibility through their application programming interfaces, or APIs (Evans et al. 2006). This behavior might be different to that in other industries where "*[i]t is unlikely that the sponsor(s) of a network with a large installed base will grant compatibility. Doing so enhances intra-network competition and […] provides very little benefit to the system sponsor. Compatibility eliminates the installed base advantage of the incumbent, reducing its market power and profits*" (Church & Gandal 2004, 21). The reverse is argued here, based on different assumptions. Church and Gandal (2004) imply that compatibility enables substitution and envelopment. Here, this is not primarily considered by remora's strategy because the host can either prevent access or absorb remoras, and therefore counter remoras that aim at becoming substitutes[196].

Church and Gandal's (*ibid.*) concern relates mainly to standards and technology. Once a standard or technology is open, the host cannot cancel the decision as the technology has become public knowledge. Therefore, accepting remoras can be perceived as reversible, while opening technology can be irreversible. The exception is when a startup performs aggregation as its content model, and can *envelop through content*; as such, it can envelop the target if the user is not motivated to visit the host website because information is given by the remora[197]. However, even in the case of standards, inviting competition can actually lead to a better outcome from the technology-holder's perspective. As noted by Shy (2011, 131), "*Sony did not use [open] strategy and as a result it had to abandon its Betamax video technology in 1988 because it refused to license it to competitors, thereby paving the way to VHS standards*." In sum, it has been established that the host has an incentive to offer its platform, and remoras have incentives to join it.

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[196] Furthermore, the risk of envelopment only applies to complements that are platforms. Most complements (i.e., apps) in social platforms, for example, are stand-alone products that together increase the utility of the platform. Envelopment would take place if popular apps were to move away from the social platform, taking users with them. Such a coordinated move seems unlikely and, even in this case, the user would most likely multihome given that, even without the complements, the social platform offers intrinsic benefit while sufficient friends, who are not associated with apps, remain.

[197] Google is an example of a remora; it scans and indexes host sites, and then displays information in search results. It utilizes content from other websites to monetize.

The purpose of the remora strategy is to gain benefit from an existing installed base, and therefore it is assumed that users' switching cost is low, thereby moving from the host platform to the remora platform[198]. Eisenmann et al. (2011, 136) assert that *"[i]f users switch between rival providers of a shared platform, they do not forfeit platform-specific investments in complements or in learning the platform's rules.*" The interface remains similar and users remain in a "trusted" environment. For example, building an application on top of Facebook does not require users to migrate from Facebook. They can find the app through Facebook and utilize the familiar interface to access it (i.e., low learning curve), and therefore the cost of adoption can be less.

Additionally, the remora can gain brand spillover effects (Olson 2008) from the host platform's enhanced adoption. The host's strategy, in contrast, is to prevent over-excessive brand spillovers that might compromise its platform through abuse or dilution by the remora (*ibid.*). The platform owner also aims to benefit from direct monetization while avoiding the *commodity trap*; that is, offering infrastructure without control of customer relationships. Those joining the platform want to benefit from the owner's reputation. This conflict is shown in practice by, for example, Facebook's rules prohibiting the use of its supposed endorsement, and the willingness of competitive organizations to associate with Facebook by utilizing its logo or other signaling devices (see Facebook 2013).

Essentially, by committing to a platform, a remora makes relationship-specific investments, and will therefore be vulnerable to related problems: sunk costs (i.e., technology development that cannot be redeployed), power abuse (e.g., host changing the terms), the hold-up problem (i.e., difficulty of switching in the case of abuse), and even the free-rider problem whereby the platform owner employs remoras to increase its popularity among end customers while retaining all associated economic gains[199]. Cennamo and Santalo (2013) note that "*[h]igher sunk costs that are relationship specific imply […] a higher exposure to hold-up problems*." Applied to startups, a learning curve can emerge for platform-specific skills if the host platform's technology differs from the startup team's skill set.

Compatibility with the current team's skills is an influential factor as a high degree of compatibility requires little adaptation with regard to product development. However, developing for a single platform (i.e., single-homing) might become highly asset-specific (see 'multihoming' in Subchapter 4.7.3). When

[198] In fact, there is no switching as the startup will become a complement not a substitute. We can refer to this as the 'conversion cost', essentially implying the same propensity for a user to join the startup's platform.

[199] For example, free apps increase the attractiveness of Apple's App Store, although an Apple device is needed to access them. Developers do not receive revenue from hardware sales.

joining the platform requires skills that can be redeployed in the case of exit, asset-specificity through skills will not become an issue. In fact, many current online platforms utilize open Web standards and programming technologies (Zeldman & Marcotte 2009); therefore, learning them, although being a sunk cost, does not lead to asset specificity.

Further problems, from the remora's perspective, include substitution by acquisition or rivalry (i.e., *absorption through substitution*). The former hurts non-acquired competing startups while the latter is harmful for all firms in the vertical entered by the platform. The platform owner can utilize its marketing power to secure better positions within the platform for its own features or those of the acquisition target, when acquired. It is in a far superior position regarding download trends and other types of information than remoras, from which this type of information can remain hidden. In the presence of asymmetric information (i.e., host advantage) and delegation of marketing and distribution, a natural condition of moral hazard arises (e.g., Pauly 1968). In other words, by utilizing its power to exercise *favoritism* for developer *A*, the host will neglect the delegated tasks from developer B. In reality, this is a common practice[200], although platform owners tend to build it as a *marketing mechanism*, so that the most popular applications receive the most prominent positions in leader boards and category views[201].

The issues of power and dependency have been widely discussed in the literature beyond two-sided markets theory. For example, Yli-Renko and Janakiraman (2008, 134) argue that "*resource interdependencies with other organizations are viewed as constraints and restrictions; that is, being dependent on an exchange partner means that the partner has increased bargaining power. Therefore, to survive and succeed, firms should take action to minimize threats to organizational autonomy and attempt to control the resources needed by other organizations to make others more dependent on themselves*." In the platform context, whether to depend on the platform's resources or *become* the platform on which others are dependent is precisely the question; both include risks, hence the dilemma. Exchanging power for delegation, becoming dependent on sunk costs, and the opportunity cost of "going solo" are hazards of the remora strategy. In contrast, opting for an independent launch in platform markets is problematic when the platform is incompatible with an incumbent platform.

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[200] "*Sorting applications on the basis of popularity, the platform sponsor can choose to own the highest rank order items, as Microsoft has chosen to do for its operating system and game platforms"* (Eisenmann et al. 2009, 147).

[201] The classic conundrum for the non-favored application, therefore, is: *How to get visibility without downloads, and how to get downloads without visibility*? Hence, the need for a marketing function re-emerges.

This is noted by Farrell and Klemperer (2007, 2045): "*Switching costs and network effects can work in tandem to discourage incompatible entry: switching costs discourage large-scale entry […] while network effects discourage gradual, small-scale entry*." A large-scale entry can be ineffective because the installed base is unwilling to become a new platform, whereas a small-scale entry would initially provide the platform for a small network of users, although their adoption is prevented by the critical mass in the incumbent platform. Therefore, the startup ends up in the familiar double-bind: the cold start dilemma, which also represents the tendency of going "back to square one", as discussed in Chapter 4.8.

Although strategic thinking influences the behavior of the platform owner, it is not entirely sovereign in its use of power. Instead, it needs to consider 1) inter-platform competition, and 2) quality. Consider the negative effects that a large-scale exit by high-quality supply-side actors would have on the demand-side as a result of power abuse. This might also lead to high-quality users, in terms of their high willingness to pay (WTP), exiting the platform; the remainder would be low-quality complements (e.g., apps) and low-quality users (e.g., free users). This type of escalating chain of events, led by the exit of actors from one side, has been highlighted by Akerlof (1970) who argued that a *lemon's market* can arise if high-quality actors from one market-side abandon a market, followed by high-quality actors in the corresponding side, leaving only low-quality actors in each side.

The degree to which hosts utilize power varies to a great extent. Open platforms, such as Linux in the operating system market, allow the greatest freedom, although often the least business support, whereas more closed platforms (e.g., App Store) can include users with higher *willingness to pay* (Developer Economics 2012). If the startup monetizes directly, the feasibility of joining a platform relates to its user base's WTP. If network effects are a factor in WTP, opening the platform might increase aggregate WTP because interoperability enables access to a larger user base (Eisenmann et al. 2009).

It is relevant to note that the remora's achieved network will not compete against that of the platform owner while the remora's users continue to emerge from the network; this is because its user base will always remain a subset of the platform's user base. In contrast, envelopment aims to take the users away from the remora. This is the *complement effect*, which makes it feasible for the platform owner to attract new remoras; in other words, new complements invite new subsets[202], and the entire network size expands.

[202] Although the host network will grow and feed remoras, the reason it will grow is because of remoras. Effectively, this is a solution for the cold start dilemma, as suggested in Subchapter 4.5.3.

The characteristic of social networks to initiate sub-networks (see e.g., Ganley & Lampe 2009) in fact gives support to the remora strategy. This is because they become a powerful entry barrier; for example, consider an entrant who would like to create a social network for a particular niche, such as dog lovers. The entrant will soon discover that the dominant platform most likely includes a sub-group sharing this interest. If not, then the entrant can begin such a sub-group and become a complement, which explains why the diffusion effects are so strong in the social platform field. In addition to network effects, complements, including user-generated groups and applications created by developers, increase the platform's benefits for existing and new users. At the same time, sub-groups introduce an entry barrier for new social platforms; therefore, the remora strategy becomes feasible, given that the platform allows monetization. For example, in Facebook this is possible independently, but Apple controls it in App Store. Although application developers might enjoy monetization gains, users who create new social sub-groups are not typically included in revenue sharing (cf. Facebook); this is not in conflict with their motivation, which is more intrinsic than profit-driven motives.

Some authors argue that the Internet is characterized by *winner-takes-all* effects, which are more or less stable in the presence of strong network externalities. For example, Herings and Schinkel (2001, 25) state:

> *"The fabulous dynamics of the information and communication technology sector makes monopoly positions to be temporary. As soon as the speed of technological innovation diminishes, […] it is nearly impossible to enter into a sector with strong network externalities and one monopolist."*

The first argument is easily acceptable as seen by quick transformations in a few key Internet markets; for example, MySpace replacing Friendster, then Facebook replacing MySpace as the most popular social network, and similarly, Yahoo being replaced by Google in a relatively short period of time (Gawer & Cusumano 2008). However, a major relaxation to the second argument of impossible entry, it can be argued, is when the market is suitable for network externalities *in general*, not only in the case of the dominant company; that is, multihoming takes place (Mital & Sarkar 2011). Thus, if we consider multihoming behavior, which is customers willing to join several competing platforms, the argument of impossible entry disappears. This is because network externalities are not mutually exclusive and can be utilized by many companies in the market, given that they are able to provide benefits that interest users. If we were to apply a third assumption, namely interoperability, the initial argument would become even weaker. In an environment of strong interoperability between platforms (e.g., through APIs), there is less incentive to remain a proprietary user, or provider, of a single platform, given that the

users are active in taking advantage of this feature, and that supply-side participants can monetize within the platform. In fact, this can be seen in the anecdotal evidence of people subscribing to several social networks and porting contacts between them, and also developers creating products for several competing platforms.

4.7.3 Solution: Diversification

A common strategy to reduce dependence on a single platform is diversification to several host platforms, similar to multihoming in the platform literature (Rochet & Tirole 2003; Armstrong 2006). In this strategy, the startup utilizes several host platforms instead of only one. Salminen and Teixeira (2013) suggest that developers should multihome to avoid being trapped in a single application marketplace. Hagiu and Yoffie (2009) provide the example that firms can advertise on both Google and Yahoo platforms; that is, employ them as marketing channels to drive search traffic. This idea is now developed further through a concept called *selective integration* that, along with associated strategies, is defined below:

- **Selective integration**: a strategy of choosing which parts or functions of a platform are integrated with a host platform.
- **Content envelopment**: using aggregation from one or several host platforms to gather a critical mass of content, after which UG negate any dependence.
- **Value envelopment**: changing the monetization model when passing users from the host to the remora.

First, diversification takes place when the remora sources content or users through aggregation from several hosts. In aggregation, the remora feeds from several sources; as such, the host might either not necessarily be aware of the remora's existence[203] or welcome it[204]. Aggregation reduces dependence from a single source. A simple rule for dependence of the remora on the host can be given to illustrate diversification effects through aggregation:

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[203] As in the case of the auction platform startup in the sample that aggregated results from several sites. However, lack of awareness might not necessarily help, as it effectively prevents cooperation. If hosts are cooperative, hiding from them achieves smaller payoffs.

[204] As in the case of Google, whereby all websites want to be included regardless of the fact that Google monetizes their content, the benefits of getting free traffic overcome this nuisance.

$D = 1/x$, in which D = Dependence, x = number of hosts

As x approaches infinity, D approaches zero, assuming equal performance across x. In reality, we observe this effect, for example, through search engines that aggregate the content of billions of websites; their dependence on one site is diminishingly small, whereas a developer's dependence on Facebook or Twitter, given that the number of available hosts is much smaller, is naturally bigger. A good example is Google: because it indexes billions of websites, its dependence on a single site, no matter how big the size of the site, remains very low; therefore, Google as a remora has the power advantage.

Second, as part of diversification, a startup might opt for selective integration, a type of mixed strategy that would take place when the startup partially leverages one or many host platforms; for example, as a source of content or users, while maintaining, for instance, monetization alternatives in its own platform. This is the case when the monetization model changes in transition from host to remora, so that:

Host → indirect monetization
Remora → direct monetization, *without* revenue sharing

The transformation of a monetization model can be referred to as *value envelopment*. An example is when the users of a free platform become paid users of a remora (e.g., Zynga as the remora and Facebook as the host). The platform owner applies an indirect monetization model (e.g., advertising), while the remora applies a direct monetization model (e.g., selling virtual goods), without the host being part of revenue sharing. In another setting, the host monetizes by distributing its complements (e.g., free apps), and then applies a more or less generous scheme of revenue sharing.

The reverse can also occur, whereby monetization is delegated to the host. This is the case when the remora joins an online advertising network, such as *Google AdSense*. The agent will then resell the advertising inventory[205], and the startup is able to capitalize on the aggregated content. A special case is termed *arbitrage*, in which the platform simultaneously buys cheap clicks (i.e., visitors) from the network and sells more expensive clicks in return, profiting from the price difference (Gunawardana, Meek, & Biggs 2008).

Third, content envelopment takes place when aggregation occurs for a limited time: that is, sufficient to obtain a critical mass, after which UG effects begin to take place. In this option, the startup employs technology to aggregate

[205] In practice, AdSense employs an algorithm based on, for example, semantic matching of content and keywords, and advertisers' placement preferences (see Salminen 2010).

content to solve the cold start problem, but then relies on user generation (UG). Aggregation is a means of employing technology to retrieve content. The goal of employing aggregation[206] as a content model is to solve the cold start dilemma because the host provides the content. Additionally, when aggregation is employed in relation to diversification, it has the potential to solve the remora's curse by reducing dependence on a single host. After this, specific problems relate to monetization and active use, and also, in some cases, the access to *walled garden* systems, which are non-accessible by Web crawlers.

Bi-directionality and selectivity under the selective integration require closer examination. First, both sourcing and spreading content back to content or social platforms is possible. For example, a startup called AirBnB famously applied this tactic by spreading its product listings to another much larger platform. Through such efforts, the startup can reach potential users in relevant verticals; however, the host might perceive programmatic solutions in a negative light, and block access, as was the case with AirBnB and its target. Manual efforts, however, scale relatively poorly.

Second, technical solutions can be created to facilitate users' interaction with the content; a typical example being social media buttons that enable sharing with various social networks. Because social platforms are dependent on fresh and interesting content, its provision generates organic traffic for the platform without the need of integrating its product to the host. Mital and Sarkar (2011) mention two examples of mutual benefit among platforms: Facebook and YouTube, which enable the sharing of videos on the social platforms and, simultaneously, increase views as more people click to view the videos. This is a form of symbiosis between content and social features. Moreover, when platforms are differentiated, they can "share" users even when outsiders consider them competitors in the same market. Mital and Sarkar (*ibid*.) put forward the example of Facebook and LinkedIn; both are social platforms, but the creation of connections is complementary as the former is specialized in private (i.e., strong) ties whereas the latter is for professional (i.e., weak) ties. Consequently, these features explain why platforms do not expect exclusivity.

Third, the startup might aim to create embedded platforms (i.e., a platform within a platform); for example, a dating application in both Facebook and Google Plus. In this strategy, the payoff results from a spillover effect; some fraction of the overall user base of the host platform is expected to convert to

[206] A technological means to elicit information from various sources, such as public websites and databases.

users of the embedded platform. In addition, brand effects can carry over when a presence is established in a host platform[207].

In one of the post-mortems, selective integration (i.e., sourcing data but not customers) was employed to explain how a competitor was able to solve technical problems more rapidly and, therefore, produce more benefit to customers[208]. This suggests that it is possible to join a platform to source information while retaining control over customer relationships. A potential application of this solution is to keep the platform's core technology proprietary while reaching into online marketing channels; for example, by applying *search engine optimization* (Berman & Katona 2012), social media marketing, and *inbound marketing*[209]. Although successful application of these tactics might not be easy to achieve, dominant online platforms are currently easy to access; for example, search engines (i.e., content platforms) index all websites[210], and social media sites enable creation of open communities and fan pages.

From the host's perspective, remoras are complements. Should they become substitutes, the host's attitude might quickly change to being overtly hostile. As a consequence, within-platform integration sets specific boundaries to platform design; the more active the platform owner is in defending its interests, the less maneuvering space remoras generally have[211]. Diversification is facilitated by inter-platform competition and interoperability through APIs. Host platforms are open to invite remoras because complements add demand-side utility (i.e., indirect network effects) that the platform can tax. It is seemingly a win-win situation, although exclusivity to one platform reduces space for a remora's strategic maneuvering, and might be demanded by hosts under some circumstances (cf. Armstrong & Wright 2007). Aggarwal and Yu (2012) note that interoperability can be utilized to replicate the host platform's network effects due to the fact that the remora accesses the same user base as the host. They give the example of Google Social Circles that suggests to a new user

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[207] Consider the popular game *Mafia Wars* which started independently but become known, and after integration to Facebook multiplied its user base.

[208] *"That one mistake (not using or replacing Yodlee [platform] before Mint had a chance to launch on Yodlee) was probably enough to kill Wesabe alone. […] Everything I've mentioned […] are great, rational reasons to pursue what we pursued. But none of them matter if […] a shorter-term alternative is available."* (Hedlund 2010).

[209] SEO aims to increase one's search engine ranking, whereas inbound marketing aims to reach a strong presence in communities relating to the startup's industry (Halligan & Shah 2009).

[210] For example, Google scans websites that provide their content, and in exchange receive free traffic, also known as organic as opposed to paid traffic. In this model, Google is a remora that employs aggregation to tap into content platforms to retrieve sites in which its user base is interested. Any platform that has content which it allows Google to index is also a remora that receives the organic traffic.

[211] Consider Microsoft that declined to support Intel's hardware solution due to its proprietary software which could have risked Microsoft's hegemony over the platform (Evans et al. 2006).

the option of replicating his or her existing social network structure, retrieved by accessing Facebook.

There are also some downsides to diversification. Most importantly, the remora faces additional costs of accommodating different platforms. As noted by Hagiu and Yoffie (2009), downsides include "*the extra engineering, marketing, and support required to play with several MSPs [multisided platforms].*" The integration costs depend on the scope and depth of integration. In marketing integration, the costs are relatively low, whereas building separate functionality for different platforms is costly. This limits the effectiveness of the solution, especially for startups subject to resource constraints. In general, the startup's ability to maintain a portfolio of different technologies in various platforms involves resource constraints relating to team skills, time-to-market, and finances. Finally, as a technical solution to social problems (e.g., content sharing and user-driven user acquisition) aggregation has severe limitations because these problems cannot be solved programmatically. In other words, aggregation as a means to collect and treat data can be highly beneficial, but it might not necessarily be sufficient to kick-off user interaction with the content that is necessary to harvest UG effects.

In sum, aggregation from many sources is more effective in reducing the host's power than multihoming when there are a limited number of choices (i.e., the market is oligopolistic). If, for example, there is an oligopoly in social platforms, the dependence is larger due to fewer substitutes; however, assuming that these platforms compete, they have a strong incentive to provide attractive terms to complements, and thus dependence on fewer hosts can lead to better bargaining power for remoras. As such, intense inter-platform competition is likely to curb hosts' opportunistic behavior.

4.7.4 Discussion

In platform markets, remora's curse can be regarded as a tradeoff between creating a platform and joining an existing one[212], whereby the opportunity cost of creating a platform is foregoing the customer base of an existing platform, and the opportunity cost of joining a platform is the loss of power relating to technology, monetization, and marketing choices, which are dictated by the platform owner at its convenience. For example, the platform owner might decide to favor some startups over others in terms of visibility within the platform. It might also study them and decide to offer a substitute, sometimes

[212] A platform startup will effectively build "a platform within a platform", although it inherits the rules of its parent platform, and therefore remora's curse applies.

termed 'absorption strategy'. The remora tradeoff is therefore a *strategic choice*; instead of creating a platform, a startup decides to join one, thereby, in theory, eliminating the cold start problem because the platform functions as a channel for distributing the service and acquiring new users. More precisely, the strategic choice of building on an existing platform grants benefits such as saved development time, cost, and direct access to an existing user base and content. Some of these benefits can become a source of competitive advantage. In other words, the choice to engage or not is also influenced by a startup's competitive strategy.

If the platform is "fair", it does not take advantage of its power advantage. However, the state of fairness is not necessarily stable, and eventually the platform might behave strategically; for example, it would prevent a startup from gaining such excessive rents that the platform itself would become dependent on the startup. In other words, although it can be achieved, success in a platform market is capped for remoras. Finally, although not explicitly mentioned by informants, platform-reliant startups might be involved in a race to the bottom if the platform they have chosen is replaced by another platform[213].

Although platform dependence is embodied in remora's curse, the benefits might counterbalance this risk, at least in the medium term, which seems to be suggested by some anecdotal evidence, including success cases and what if statements[214]. By not leveraging a pre-existing platform, a startup faces other dilemmas, mainly monetization and cold start dilemmas, in addition to its variation of the lonely user dilemma. The benefits of the platform relate to customer acquisition and monetization[215] that, for both, the platform offers a potential channel with a critical mass. In other environments, monetization can be more challenging and customer acquisition requires seemingly more efforts[216]. Further, the platform can provide competitive advantages over rivals if it is exclusive instead of inclusive; when it is not, a remora faces intra-platform competition.

Therefore, if the startup applies a platform business model, it can become a competing platform itself by choosing the independent option, or it might turn into a *platform within a platform* by choosing to join an existing platform. In the latter case, however, its power is restricted in the same manner as if it

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213 For example, within a couple of years, Facebook replaced MySpace as the most popular social network, growing from zero to 600 million users in a few years (Hartung 2011).

214 *"So how would I do things differently today? […] I would wait until [the] location is all clean and dandy with the carriers and build on top of that."* (Bragiel 2008).

215 The host platform's coordination can increase WTP by making it attractive and easy; often termed 'attributes' of Apple's *App Store*, which collects credit card numbers upon registration and enables one-click purchases.

216 Although within the platform, the competition is typically comparable to that outside the platform ecosystem; that is, the startup cannot escape the need for differentiation.

applied a non-platform business model. In other words, the strategic choice of integrating the product on top of a platform leads to a degree of platform dependence that, in turn, increases competition against other firms within the platform[217], and also puts the startup at risk of the platform's strategic decisions, which naturally deviate from the startup's goals in some aspects. This can result in changing, for example, the rules (i.e., terms of service), technology, design, or behavior of the platform, increasing API cost or restricting access, introducing a directly competitive feature (i.e., substitute), thereby making the startup's product redundant, or acquiring a competitor and then favoring it within the platform, for example, by providing it with more visibility. As there are some vivid examples of this strategic behavior, it has been widely discussed in the startup community. Further, building a proprietary technology to integrate into the platform imposes the opportunity cost of developing an independent product, although in some cases a startup might resort to diversification to solve the dilemma[218].

However, the sample demonstrates that the multihoming process is not automatic, even if transference logic is assumed. There is a need for more research to identify the conditions for successful transference of business logic across contexts. This study, however, demonstrates that such a problem exists and, consequently, a working business model in one context (e.g., location) might not generalize, or at least requires "starting from zero", as the new market is not part of the same network.

Especially, technologically oriented founders, who are sometimes characterized by a lack of interest in marketing (see Roberts 1990), might perceive it as feasible to delegate marketing and distribution functions to the platform owner. However, they might fail to acknowledge that, within-platform, they are *also* subject to competition, and so the need for differentiation by, for example, marketing, will not dissolve. In addition, marketing is needed even when externalizing user acquisition for the platform owner, due to the platform owner's incentives to favor high-performing remoras[219].

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[217] Assuming the platform is open and there are little or no barriers to entry.

[218] Diversification can be regarded as developing a separate individual product for an independent marketing channel (i.e., website) or developing for other platforms. Such a diversification reduces the risk of lock-in, but does not eliminate remora's curse because the startup is nevertheless investing its scarce resources into the chosen platform(s).

[219] As the platform owner's revenues are directly proportional to participants in the platform, it ensures most prominence to participants that generate most revenue. In the case of indirect monetization, the revenue can be substituted with impression, clicks, or other types of economic value. The notable limitation is that the incentive does not always lead to action, which is the case of the "fair" platform owner, although the stability of such a state always represents a risk for the startup as it has no means of influencing the platform owner's strategic choices.

4.8 Summary and discussion on dilemmas

The idea for dilemmas was born from reading the material. Initially, it was discovered that founders identified and named them in their post-mortem stories. For example, one founder mentioned a "cold start problem", which was then also discovered in other cases, although not by the same name.

Table 27 Applicability of dilemmas across platform types

	Cold start	**Lonely user**	**Monetization**	**Remora**
Content platform	x		x	x
Social platform	x	x	x	x
Exchange platform	x	x	x	x

The cold start dilemma is applicable to all platform types considered in this study; a particular number or amount (i.e. critical mass) of users or content is needed to evoke willingness to join a platform, whether the platform is based on content, social, or exchange interaction. Both the cold start and the lonely user dilemmas are chicken-and-egg problems, and relate, respectively, to content platforms and social platforms, the latter requiring an active user base or content to generate growth through network effects. In addition, marketplaces (i.e., exchange platforms) face liquidity needs. It is negligible whether liquidity in their context is understood as content (e.g., product listings) or users (i.e., buyers and sellers).

The cold start dilemma relates to content platforms with interaction such as content creation and consumption, and also transactions in the context of exchange platforms, whereas the lonely user dilemma relates to social platforms with interaction such as joining the platform; typically, users register or otherwise subscribe as followers. Both, however, aim at user generation (UG) effects, so that users' actions lead to a desired response from other users, such as content contribution, sharing, and invitations[220].

Moreover, the cold start dilemma can be defined as a problem of one-sided content platform, when users are homogeneous, or a two-sided problem, when users are divided into consumers and contributors of content. Similarly, the lonely user problem can be a problem of similar side critical mass (i.e., friends or acquaintances are required to join and actively utilize the platform), or a

[220] If the users are classified as one group, it is termed a one-sided platform. If they are classified as two complementing groups, it is termed a two-sided platform. If they are classified as three or more groups, it is termed a multisided platform.

two-sided problem (e.g., men and women finding each other in a dating website). The only platform type that is categorically two-sided is the exchange platform, which always requires different sides (i.e., buyers or sellers) for interaction to take place.

In terms of implications, it is important to distinguish pure content platforms from social platforms because contributing content can be regarded as more demanding than engaging in social interaction; thus, different types of incentive might be required. Then again, for exchange it is important to build liquidity; a good volume of both sellers and buyers, so that goods are sold at appropriate prices. The incentives of the platform owner and traders are usually well aligned as the rewards of exchange platforms tend to be tied to the volume of transactions taking place in the platform[221]. Finally, social effects are associated with UG; users, for example, upload videos on YouTube for others to watch, not primarily to gain economic benefit[222].

The monetization dilemma and remora's curse are applicable to all platform startups; the company needs to be financed which requires direct or indirect monetization, that is, charging the user for access and/or usage or charging a third party, most typically advertisers. In a similar vein, it depends on the user/content acquisition strategy whether the remora model is applied and therefore applicable, which is possible in all platform types: content platforms can attempt to source content, social platforms users, and exchange platforms product listings.

It is typical that attempts to solve one dilemma result in the discovery of another. This principle is demonstrated in the following figure.

[221] However, this is not always the case; eBay takes a commission but the Finnish auction site *Huuto.net* only charges for premium services while also monetizing by offering advertising space.

[222] Although YouTube offers a partnership program for the most popular content providers.

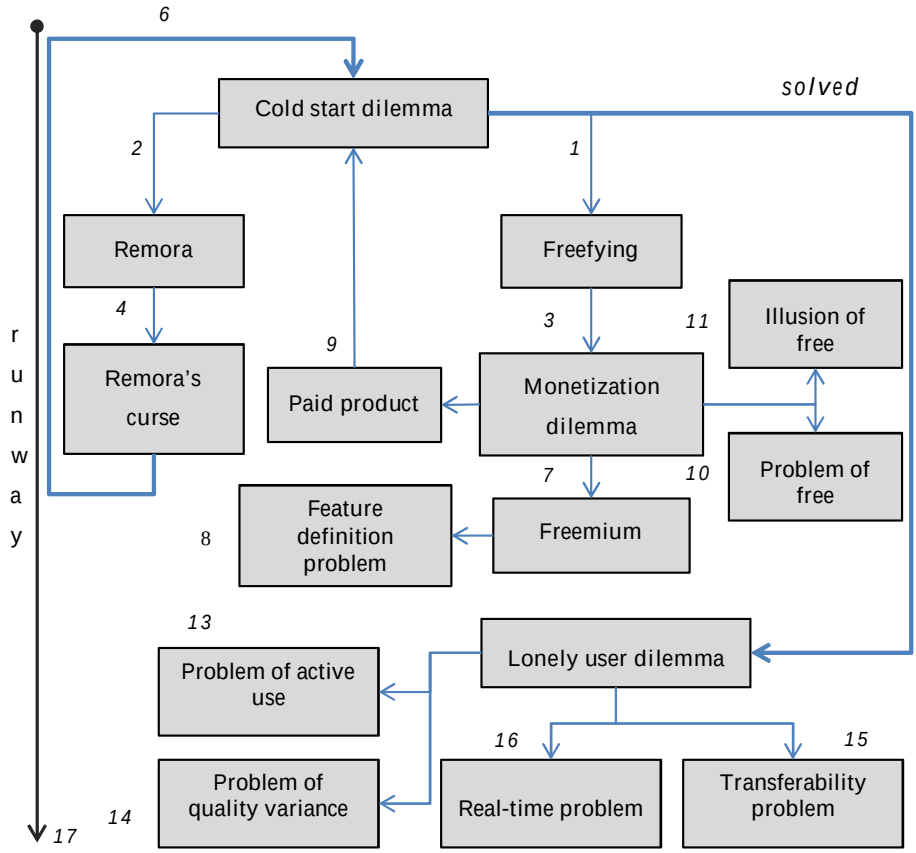

Figure 15 Dilemmas and associated problems

If solving the cold start problem or lonely user problem by offering a free product [1], the startup faces the monetization dilemma [3]. Therefore, even successfully building the user base does not guarantee business viability. This is due to the fundamental difference between a customer and a user; the former brings in revenue, while the latter brings a cost that needs to be covered by indirect monetization. There is a discrepancy between the growth of the user base and growth of revenue that is a consequence of indirect business models not being perfectly elastic to the growth of user base. This is implied, for example, in Goldfarb's (2003) model, based on the assumption

that users do not provide the revenue directly but it comes from advertisers[223]. It then follows that users are not worthless while also not being as valuable as many startup founders would like to think. Based on the author's analysis, seeking customers, even at the risk of "scaring away" users who are unwilling to pay, seems a more recommendable strategy[224]. As a minimum, the startup should look for ways to diversify indirect monetization instead of being dependent on advertising. Further, the lack of consideration for business viability also concerns the platform literature; for example, Evans and Schmalensee (2010, 5) noted "*we do not address whether a platform that attains a critical mass would in fact be profitable; this would require the explicit consideration of costs and other revenue.*"

To solve the cold start dilemma, the startup is tempted to join a platform with a pre-existing user base [2], anticipating that the barrier for users to join is lower when they have already committed to the host platform. This comes at the cost of giving away power (i.e., remora's curse [3]). Whereas remora's curse addresses managing a relationship with the platform owner, the cold start dilemma relates to becoming the platform owner. Particular problems of a remora include platform dependence and potential hold-ups. Realization of remora's curse, that is, the host platform cutting access [6] to users or content, will in effect lead the startup back to the cold start problem, but only given that it has failed to reach a critical mass.

When the startup solves the monetization problem through the freemium model [7], it is left with a problem of feature definition [8]. In other words, giving away too many features leads to low conversion from paid to free user, whereas giving too little away leads to lack of adoption in the first place. Another option is paid product [9], although this can lead to a similar problem of lack of adoption (i.e., cold start). Note that there are two different states for users' WTP: positive and negative. For negative WTP, paid products always result in defection, and there is a problem with free [10] because the startup is forced to subsidize. However, if WTP is positive, then the startup risks an illusion of free [11] in which it offers a free product, even though the users would have been willing to pay.

With regard to users, different problems arise before and after they join a platform, so that:

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[223] The assumption can be extended by arguing that the advertising market has its own dynamics, which means that users in one website are not interchangeable with those in another with regard to their advertising value. For example, consider Friendster that, when selling advertising space to American companies, noticed their visitors mostly comprised Filipino consumers (see Chafkin 2007).

[224] This line of thinking is based on the idea that not all startups can become category leaders (e.g., Facebook) that are able to accumulate hundreds of millions of page views per day, and thus attract advertisers' interest.

Before joining → cold start dilemma

After joining → lonely user dilemma, problem of active use & quality variance

The *problem of active use* [13] implies that even after solving the cold start problem, the startup is at risk of losing the achieved critical mass if the users become inactive. This can cause 'negative tipping', which is essentially the reverse of exponential growth. The *problem of quality variance* [14] will, in effect, require the startup to introduce either manual or automatic monitoring mechanisms. In the ideal user generation (UG) model, it is assumed that the user base is self-controlling; thus, the platform offers tools such as a reporting function and recruits some active members as moderators of quality. However, even if the users are active in keeping misconduct in check, the problem arises when the low-quality content is not malicious but otherwise not interesting to other users. For example, consider the case of an indie music portal that failed due to low-quality bands (Hagiu & Wright 2013). It seems reasonable to assume that, in some cases, the startup needs to incur monitoring and intervention costs to assure that the user-generated content matches the interest of other users[225].

Coincidentally, the runway [17] keeps depleting while the startup determines the problems. If founders are unaware of platform-specific issues, as many of them were in the sample, it will take them some time to understand the problem, and then some more time to think of potential solutions. Then, they might run into additional problems as displayed in Figure 17. In contrast, by being aware of potential risks, the startup is able *a priori* to prepare a range of solutions for multiple dilemmas at the same time.

Furthermore, relying on UG aggravates the cold start dilemma. Instead of in-house production or syndication through partners to acquire customers and content, the startup expects users to play this role. When the process fails, the startup can find itself looking for "plan B". However, at this stage, it might be too late, as exemplified by one startup's story:

> *"We modified our technology to be a very flexible and scalable platform from which we could launch any type of application, for any client, in any industry. We thought we could position our solution as helping brands create a comprehensive distributed touch point strategy by complementing their presences on Facebook and Twitter with a presence on IM [instant messaging]. The plan was to partner with marketing agencies as well as sell*

[225] For example, refer to YouTube's tactics of getting video material from attractive women by posting on Craigslist (Evans 2009a, 113).

> *directly to clients similar to the approach taken by providers of custom branded widgets, Facebook apps, and mobile apps. This strategy eventually produced some great results but it was a case of too little, too late. When we finally decided to pivot we had already spent most of the capital raised in our seed round."*

The end of the runway signifies failure. In the absence of financial buffers, the runway might not provide a sufficiently long period of time to solve the problems. In contrast, venture funding, although providing resources, can lock in some choices, which prevents a later adaptation (i.e., *pivot*). Furthermore, venture funding can impose a situation of "go big or go home", which might negate the apparent freedom afforded by the funding[226].

Finally, there are two specific problems associated with the lonely user dilemma in Figure 15. First, the *transferability problem* [15], which implies that a critical mass is not automatically transferable from one context (e.g., location, niche market, or demography) to another context (e.g., another city or user demography). Second, the *real-time problem* [16], which implies that, in particular circumstances, the emergence of a match between parties of a two-sided platform (i.e., network effects) is dependent on time. An empty chat room is an example: no matter how many users have registered, if none are present, their value at time *t* is zero for the only user.

This also marks how the cold start and lonely user dilemmas differ: content is static while social interaction is dynamic[227]. Registration does not guarantee content production (e.g., becoming an active user) and content production does not necessitate registration or other type of subscription. Therefore, the root of these two motivational problems differs. Simply put, it is assumed that users do not generate content for *exactly* the same reasons that they join a social network, although there might be an overlap. More precisely, their behavior can involve spillover effects, as implied in Chapter 3.3.

In sum, this chapter has shown empirical grounding to the chicken-and-egg problem presented in the platform literature. More importantly, the study has shown that the problem 1) can take specific forms (i.e., cold start and lonely user) based on the type of coordination required (e.g., timeliness), and 2) is not isolated, although some of its potential solutions applied by the failed platforms startups are associated with further dilemmas; for example, the monetization dilemma and remora's curse. This is an important finding as most of the

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[226] This was conceptualized as "Peter Pan's dilemma", although is not discussed thoroughly in the study (see Chapter 4.1).

[227] However, content can have different modes of freshness. A good treatment to the topic is given by Kim and Tse (2011) who study knowledge-sharing markets and argue that there is both knowledge that expires rapidly and knowledge that remains valid for a long time; although, while the content is static in both cases, its benefit to the user is dynamic. For example, consider yesterday's news that is not so valuable today.

literature considers the chicken-and-egg problem in isolation. It is argued here that potential solutions can aggravate the platform startup's problems in the big picture; for example, by denying monetization or making it dependent on the host platform's strategic choices. Hence, solving the cold start problem can come at a significant cost, and thus 3) potential solutions need to be considered in terms of their impact on cascading dilemmas and problems.

5 SOLVING THE DILEMMAS

5.1 Introduction

As described in the method chapter, after several rounds of GT analysis, the researcher reverted to the data, and coded 1) “what if’” statements from founders; that is, what they would have done differently; and 2) the attempts expressed in the post-mortems to solve the problem when it had been identified. This process was accompanied by interviewing six startup founders. The proposed solutions are synthesized with the platform literature, and their strengths and weaknesses discussed. In addition, separate solutions that arose from the literature are analyzed in terms of their appropriateness. Finally, a summary is presented.

The solutions here do not relate to pricing, subsidies, or integration into a larger platform (i.e., remora), as these solutions and their strengths and weaknesses have already been discussed in the previous chapters. It is also noteworthy to mention that in most solutions, sides of the platform are treated separately. Essentially, if growing each side separately from one another is taken as a goal, the chicken-and-egg problem transforms into classic marketing problems: "How to acquire customers?" and "How to build awareness?". This vastly expands the scope of solutions as an array of marketing tactics (e.g., promotion, personal selling, and various means of digital marketing) becomes available.

Despite this premise, a startup is forced to consider both market sides (i.e., sets of customers) to generate any action on the platform as their interdependence remains, regardless of the applied user-acquisition methods. However, some observed solutions are now discussed.

5.2 Solutions

5.2.1 Exhibits

The solutions discussed in the following are formulated and given names based on the post-hoc analysis. Exhibits of these solutions are presented in Table 28.

Table 28 Exhibits from post-hoc analysis

ID	Insight
[A]	*"One of the unseen benefits of the new system was that it enabled us to anonymize, extract, and aggregate bookmark data. So we dove into that and started looking at what products we might be able to deliver powered by the "corpus" of what would soon be 100 million bookmarks."* (Agulnick 2010).
[B]	*"This was no mean engineering feat. We had a very, very large and complex back-end. And even with this, the quality of the data coming through to the end-user was just not that good. Too much spam, still. Duplicate posts. Sometimes mis-categorized. Difficulty applying our reputation algorithms. Not good."* (Ehrenberg 2008).
[C]	*"[The startup] employed a group of talented journalists and community representatives who sought out and interacted constantly with members of each of our communities to encourage them to participate."* (Potts 2007).
[D]	*"The main failure of [the startup] was marketing. Dev and I came from PayPal, a strongly viral product at a company almost hostile to marketing. Our efforts in SEO [search engine optimization], SEM [search engine marketing], virality, platforms, PR, and partnerships weren't terrible, but drawing users to a live event requires constant, skillful work."* (Goldenson 2009).
[E]	*"Like creating content, I no longer think marketing is something smart novices can figure out part-time. As the Web gets super-saturated, marketing is the difference-maker, and it's too deep a skill to leave to amateurs […] Next time we'll raise enough to hire a marketing expert early."* (Goldenson 2009).
[F]	*"We struck upon the idea that if we had fifty journalists, and they each cross-promoted each other to their social networks, then over time we would get more and more people to read each other's content."* (Biggar 2010).
[G]	*"Because we were basically calling on friends of friends who ran events to be our customers, we didn't learn what event organizers in general wanted or how to acquire them as customers in a scalable way with the 'private social network product'."* (Johnson & Fraser 2010).
[H]	*"We could have and should have used the proceeds of the convertible note to get out from under Facebook's thumb rather to invest further in the Facebook platform."* (Rafer 2009).
[I]	*"Since the service was our child we were reluctant to make a decision about closing it faster and limit losses. We've been tricking ourselves thinking that everything would be fine while we couldn't get the application back to work properly."* (Brodzinski 2009).
[J]	*"[The startup] was designed as one community, but it really was a network of unaffiliated communities. […]. The site was not optimized for that. We should have had more tools for assignment creators to tie their contests to their existing communities."* (Powazek 2008).
[K]	*"It's very, very difficult to start from scratch in a community and get to critical mass without help. For a variety of reasons that made sense at the time, [we] chose not to go the media partner route. But as newspapers and broadcasters have become more savvy in the past few months about their need for hyper-local efforts, it makes more sense for hyper-local entrepreneurs to hook up with media partners […]."* (Potts 2007).
[L]	*"Figure out the difference between a website, a service, a product, an application and a platform. You need to figure out which one you're building because what users do with each one and how you make money is very different. If you answer all of the above, you've got a problem because the answer determines why people use what you're offering, and it says that your focus is scattershot. The difference between these is another post entirely, and one I'm probably not qualified to write yet."* (Hemrajani 2010).
[M]	*"To serve investors and the entire ecosystem who we heard from, we launched CB Insights, a subscription platform that offers faster, friendlier, comprehensive intelligence about private companies. It was built after talking to customers this time […]. To serve entrepreneurs, we remade ChubbyBrain as a place to leverage our data in ways that would benefit them. Our first tool is the free Funding Discovery Engine (FDE), which emerged directly from the question we repeatedly got from entrepreneurs to the old ChubbyBrain […]."* (The Chubby Team 2010).

[N] *"I had to deal with, while building BricaBox, why we weren't modifying an existing Open Source solution, like WordPress MU. We were a CMS [content management system] at heart, after all. Next time, I'll give more consideration to building off and participating in existing Open Source project."* (Westheimer 2008).

[O] *"Another reason PlayCafe's complexity hurt us is that developing good content and technology simultaneously required too much time. We tried to make each deep and stable — important, we thought, given our live nature — but we were too slow to iterate in a novelty- and entertainment-based business."* (Goldenson 2009).

[P] *"The easiest way to avoid chicken-and-egg problems is simply to have a product that is useful on its own. Del.icio.us, for example – it's just a bookmark manager that happens to be more useful as more people use it."* (Tang 2008).

[Q] *"The way to do it seems to be to make sure you're passionate enough about your own product to use it yourself (like submitting your own stories to Reddit, or how we all created 3-4 sockpuppets at in Asphere and had conversations with ourselves on the forums) and to get out there and put it in front of lots of other people. It's that last point where we failed: we just kinda built the product, launched it, and let it die."* (Tang 2008).

The following sections address the treatment of the exhibits and interviews in alphabetical order.

5.2.2 Advertising

Advertising emerged as a topic in the interviews. Especially in platforms that serve consumers (i.e., side A, demand) and companies (i.e., side B, supply), it was perceived as important that the platform owner conduct marketing to attract consumers. Often, founders simplify marketing to mean advertising. Although marketing comprises much more than advertising (e.g., Hunt 2002), it is discussed here as a possible solution.

In general, there are two approaches to advertising:

Strategy A: mass media advertising
Strategy B: targeted, niche advertising

While the former is generally considered too expensive for startups, the latter seems a more feasible tactic. In fact, both were mentioned by the interviewed founders. One of the founders explained that their local market in Africa has quite low mass media advertising costs, and that if they were able to acquire funding, they would employ it to drive adoption through mass media. Another founder mentioned that they only employ targeted, low-cost advertising. Another interviewed founder mentioned, early in the interview, "*all morning we have done Facebook advertising*" and revealed that it is the most cost-effective marketing channel for them. This was interesting, as most startups placed Google before Facebook.

In the discussion, it came apparent that marketing "super platforms" exist that enable almost anyone connected on the Internet to be reached. In particular, two alternatives were discussed, Facebook and Google:

- **Facebook:** enables targeting social network users, based on their demographic information and preferences (i.e., likes), with organic and paid messages.
- **Google:** enables targeting searchers, based on, for example, keywords used and location, with organic website content and paid ads.

Characteristic to the low-cost advertising approach are testing with small budgets, carefully calculating the cost of conversion, and attempting to find keywords or demographic niches that are more likely to attract users to the platform.

In general, the marketing platforms require very little startup capital, and enable freedom in managing the budget and also highly advanced targeting functionalities:

Google AdWords → search intent
Facebook Ads → demographics and preferences (i.e., likes)

Somewhat consistent with the earlier division, these two often mentioned marketing channels are distinct in terms of motive of usage (Google → content, and Facebook → social interaction).

The main limitations of niche advertising are: 1) user acquisition through linear growth; that is, the more users are wanted, the more it will cost. Often, this results in issues, as the user acquisition cost is higher than the immediate or lifetime revenue of the user, which is particularly relevant when the platform offers free access and usage. In such a case, there is incompatibility: paid user acquisition and free offerings can easily tilt the finances of a company into a critical state; 2) there are natural limits to the size of a niche: if, for example, a niche is based on a particular interest in a particular location, the growth potential remains limited[228]; and 3) platforms are expected to accumulate new users as interaction becomes self-sustainable, and therefore advertising can be perceived as a kick-off or temporary solution, not one that is sustainable or structural.

As a consequence, the following proposition can be formed:

[228] Although this feature is a consequence of small market size, it is nevertheless a limitation.

Proposition: Advertising is a successful solution to the cold start dilemma if it leads to exponential, not linear, growth of user base and interaction.

Other limitations of advertising are resources, know-how, and return on investment. Startups tend to lack marketing skills and budgets. For example, the interviewed startup which mentioned Facebook as a cost-effective method of user acquisition is in close partnership with an advertising agency that provides them with marketing services on an on-demand basis. Based on other investigated cases, this is a rare luxury among startups. Return on investment, also termed ROAS (i.e., return on ad spend), measures how well advertising investments generated revenue. As noted by one of the interviewed founders, if paid user acquisition is applied, the platform's revenue potential must be high[229].

5.2.3 Aggregation

The tactic applied in [A] was to aggregate data from various sources into a single "corpus" of content that would be valuable to the platform's users. Although this tactic seems to have some potential, the example of [A] vividly shows the linkage between the cold start and monetization dilemmas: that solving the cold start dilemma by aggregating data leaves the question "*how to monetize this data?"* unanswered.

First, it is not self-evident that the data, or content, *per se* are valuable to users and, second, that they would be willing to pay for accessing it. Further, as described in [B], the quality of the aggregated data can become problematic. According to the ideal user generation (UG) model, deploying users to "clean" the data is a potential solution, although this can be problematic given that users might want high-quality data but might not necessarily want to produce/edit it. Thus, the cold start dilemma is effectively not solved by aggregation unless users consider the provided content suitable for their needs.

5.2.4 Community

If theoretical network effects do not materialize, the ideal UG model fails and the startup will be in trouble. Consider the case reported in [C]: for the purpose of kick-off, or *community building*, the approach seems logical and sound. However, it simultaneously restricted the startup's opportunity for

[229] CAC (customer acquisition cost) < CLV (customer lifetime value).

horizontal expansion, in this case to other cities[230]. An approach is to utilize the user base to establish a trusting relationship with the networks of the current user base: [J] hypothesized that creating better tools for their user base to promote their content might have made a difference. This overlaps with [F], but also risks over-reliance on the ideal UG model[231].

Another approach employed by an interviewed founder was to participate in community discussions; for example, by offering help and advice to questions relating to the startup's domain of expertise. Based on the ad-hoc analysis and the interviews, the following two strategies can therefore be devised:

Strategy A: Community building
Strategy B: Community participation

It seems that community building requires active effort by the startup, and thus they tend to hire community managers to stimulate platform participation. This solution requires resources and puts a heavy strain on the company's finances, especially when applying indirect monetization. Although profitability might not be deemed a necessity for an early-stage startup, at some point the platform should scale profitably (i.e., the assumption of non-perpetuity of free). Further, the founder in exhibit [C] argued that in-house community managers cannot replace community participation in volume, and that their impact is limited to nurturing community participation. In another case, sourcing high-quality content from professional journalists solved the cold start problem, although the startup failed to get the demand-side on board, and the network effects remained theoretical.

5.2.5 Exclusivity

Relating to complements, Cennamo and Santalo (2013) identify content exclusivity, which can be reached by negotiating with and contracting suppliers. However, exclusivity might not be realistic in the case of an early-stage startup when the developer or producer of complements (i.e., content) takes a risk on the platform's future survival. For example, in mobile applications markets, successful applications might multihome to maximize their profits,

[230] For the hyper-local problem, refer to Subchapter 4.5.1. Essentially, network effects might not generalize; for example, connections in one city do not provide benefits in another city.

[231] For example, Ries (2011) alerts founders: *"Although many eBay fans love to tell their friends about it, they really don't have a need to bring them on board. As far as they are concerned, that's eBay's job."* Founders are enticed to expect more marketing support from users than users are willing to contribute.

regardless of a particular platform's ability to provide a critical mass (Hyrynsalmi et al. 2012). Therefore, the proposition of limiting developers' choices through exclusivity seems theoretical in the Web context. Moreover, the solution assumes complements or an industry-perspective as described by Gawer (2009). In contrast, startups can rely on UG, without complementors, and "getting big" might be less of a concern than attracting the correct type of participation (see Subchapter 4.5.2).

5.2.6 Facilitation

In this section, two approaches to facilitation of interaction are considered: transaction costs and services. First, Spulber (2010) shows how a platform owner can reduce participants' transaction costs. This is an important strategy as the coordination benefits are strongly associated with transaction costs (Kärrberg 2010) such as searching, contracting, and monitoring the party of interaction. However, reducing transaction costs for involved parties can leave the platform vulnerable to free riding if it is unable to extract rents; this relates to the monetization dilemma, which assumes that users will fall back to satisficing behavior if fees are introduced.

Furthermore, the reduction of transaction costs already assumes a critical mass. For example, to solve the problem of finding a date, a dating platform *already* needs a user base of both men and women, otherwise the search continues. Therefore, as a solution to the cold start problem, reducing transaction costs remains theoretical in the absence of a critical mass.

In addition to technological match-making algorithms designed to reduce transaction costs, the platform owner can provide its members with services or tools relating to marketing and differentiation. For example, one of the interviewed startups offered several features of this kind:

- Reviews of platform members
- Informative dashboards
- Transparency of statistics relating to profile activity.

Although these features might increase commitment to and active use of a platform, their utility is ultimately dependent on the interaction level. Therefore, adding, for example, self-service marketing features cannot be regarded as a definitive solution.

5.2.7 Funding

If lack of funding is assumed to prevent user acquisition, getting funding seems like an obvious solution. In another case, a startup might acquire funding to exit the remora position [H]. However, pivoting is hindered by sunk costs that can prohibit a switching strategy [I][232]. Although funding can be applied as a general solution to cold start and lonely user dilemmas, how funds are employed seems to be more critical [H]. Furthermore, funding represents another type of chicken-and-egg problem: *legitimacy*[233].

Funding was also a recurring theme in the interviews. Although the author did not specifically refer to funding, the theme was frequently mentioned. Related statements by founders included, for example:

- "*If we had money, we could grow faster*."
- "*If we had funding, we could jump forward in time*."
- "*We are looking for funding, because local TV ads would make our name instantly known*."

However, acquiring funding is an indirect solution as it is based on removing the constraints of the startup condition, and thereby enables a wider access to solutions such as mass marketing. Funding, therefore, has an instrumental value in solving the cold start dilemma. It does not relate to the lonely user dilemma that, to be solved, requires intrinsic value within the platform, otherwise existing members will not interact. Moreover, it does not solve the monetization dilemma. In fact, acquiring funding can become detrimental in the financial sense: consider that the startup is able to acquire and carry users in the short term but, due to a lack of sustainable revenue base, will, as a business, collapse in the long term. Finally, funding also plays no direct role in solving the remora's curse. The main way it is associated with this dilemma is through company acquisitions; a startup with large cash reserves might be able to purchase its competitors and combine their user bases with its own.

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[232] The sunk cost effect is well documented in the literature (see Arkes & Blumer 1985), and it might hinder the ability of a startup to pivot (i.e., change its business model or strategy).

[233] As described by Rao, Chandy, and Prabhu (2008, 59): "*To overcome stakeholder skepticism, new ventures need successful new products, but to have successful products, they must overcome stakeholder skepticism in the first place*". This thought emerges from the classic notion of 'liability of newness' (Stinchcombe 1965), according to which new ventures face resistance not because of their product's performance but due to its newness. A solution offered for this problem by Rao et al. (2008) is to prove the startup's potential by actions that increase legitimacy.

5.2.8 Get big fast

Cennamo and Santalo (2013) propose the “get big fast” strategy that requires 1) rapid acquisition of a user base, 2) creating lock-in mechanisms, and 3) reducing the ability of competitors to acquire and lock in users. They go on to specify *how* this will be achieved: the first option is indirect monetization, by which the platform invites one side for free, and then charges the other side for access to these users. While the emphasis of speed in this strategy seems appealing, the problems, as discussed previously, include 1) finding the proper “other side”, and 2) realizing theoretical network effects (i.e., creating actual matches and interaction).

An execution of this strategy, mentioned by a founder during an interview, is to contact *chains* instead of individual business units; the less there are individual decision-makers to persuade, the faster the startup can build critical mass. This strategy aims at large-scale capture of the market instead of a step-by-step approach. Consider, for example, a national restaurant chain with hundreds of venues; choosing such a partner delivers instant supply in many locations, which differs as a goal from the bowling pin and other sequential approaches as it aims to grab local markets through strong partners. However, there are issues of legitimacy (Stinchcombe 1965) in persuading large partners. Also, competition for their attention is fierce, and thus the startup often needs to find a key person inside the firm (a "trusted insider") to be able to solve gatekeeper and legitimacy problems.

5.2.9 Influencers

Influencers were employed in two ways by the interviewed startups: first, as professional bloggers who write about or contribute to industry-related articles in the startup's blog. For example, one of the interviewed founders employed interviews to get “important people” to discuss relevant topics. The win-win outcome of this proposition is as follows:

Benefit A: The influencers reinforce their status as opinion leaders in the domain.

Benefit B: The startup gains legitimacy as a hub for professionals.

The industry-related articles are then shared in relevant forums and social media groups. The second way mentioned by the interviewed startups was “seeding”, dubbed here as the *traveling salesman effect*, according to which affluent users adopt platforms in one location and help spread them in other

locations (e.g., when returning home from conference). The idea is based on "virality", so that good platforms are contagious and spread by affluent users moving from one location to another. In reality, the effect has not been proven as a sustainable and effective solution by any research of which the author is aware; rather, it seems over-optimistic to rely on this form of “goodwill marketing”.

5.2.10 Legitimacy

To build legitimacy, references and testimonials (cf. Aarikka-Stenroos 2011) are advantageous for the seller. Legitimacy can also be built through presentations (e.g., keynote presentations) at important industry events, although this tends to require some form of established credibility.

One interviewed founder discussed industry events, in which the startup can present its know-how on the area and signal credibility to important industry actors. Events are possible in both B2B and B2C markets; for example, Twitter was promoted successfully at the famous South by Southwest event. To gain legitimacy, another interviewed founder mentioned creating an impressive website to make the startup appear bigger than it was in actuality. The effort was intended to create a sense of trust among the parties and, therefore, attract them to join.

5.2.11 Market-making

To solve the cold start problem, a startup can become a party in a transaction (Spulber 2010). This differs from self-generation because in market-making the startup becomes a counterpart in transactions (i.e., exchange partner), whereas it provides the initial content in content platforms. Also, Hagiu (2006) notes that a merchant mode can provide a solution when a cold start is severe. The idea is based on the platform breaking the influence of indirect network effects, which are mainly the fear that the other side will not materialize, by acting as the other side. The startup might not necessarily take charge of all transactions but provides a guarantee of liquidity if the other party is missing (Spulber 2010).

In the case of one interviewed startup, the market-making process included the following activities:

- **Personal selling**: to explain to the client how the match-making model works.
- **Escrow agency**: to mitigate the non-payment problem (i.e., clients not paying for the work provided).
- **Bidding game**: to guarantee best price.
- **Member check-ups**: to guarantee quality and avoid the low-quality match problem (e.g., work experience, price, and documented references).
- **Convenience expansion**: expanding member base based on type of new projects (i.e., finding workers according to client needs, and retaining them[234]).

The platform will essentially absorb the risk of non-participation from one side; however, at the same time, this implies foregoing the platform model in exchange for the merchant model, which might not be a long-term solution if the startup aims to operate as a platform.

Nevertheless, this strategy aims to produce a sufficient amount of liquidity for *initial* interaction, so that UG will kick-off. The startup will not definitely assume the role of a transacting party, which is why the strategy differs from vertical integration[235]. There are examples of permanent transformations; for example, consider Zappos that began as a platform but transformed into retail because it found it easier to absorb the consumers' risk of slow delivery. Equally, a startup can absorb the supply-side's risk; in effect, the merchant mode removes the risk as the startup will first buy whatever the seller has and then resell it. As Hagiu (2007) points out, in the short run, this makes sellers indifferent to the number of demand-side participants.

A specific form of market-making in content platforms is in-house content creation. This form of the solution is defined as follows: after launch, the startup will create content until a critical mass is reached. Up to that point, with in-house generation, the growth of users and content is *linear*; however, when achieving critical mass, users begin to contribute and invite other users, leading to *exponential* growth. At this point, the platform will no longer depend on the content provided by the startup. In other words, the content is provided only until a critical mass is reached (i.e., during cold start), and then delegated to users according to the ideal UG model. In reality, however, the startup can face complications during this period. For example, early adopters

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[234] This approach can be perceived as useful when the startup is uncertain of the demand side's exact needs; in spirit, it is compatible with the notion of market orientation.

[235] In vertical integration, the startup would become a permanent counter-party, and the platform would lose neutrality.

and the mass market might not behave similarly, or there is a "chasm" between one group and another (Moore 1991). Also, if the startup opts to replace UG with manual efforts, it might notice that sales are not scaling without considerable investment in a sales force[236].

If the startup applied in-house content generation as a long-term strategy, it would consistently generate high-quality content. However, this is not compatible with the ideal UG model. In fact, if the startup were to incorporate the content production function, it might risk reverting to "square one". This is because in-house efforts do not produce economies of scale comparable to the Internet's user base. The idea is to leverage the creative work of users but, in turn, this leads to the cold start problem. Therefore, although the startup founder can give an initial push, this method is not viable in the long term. In-house production can only work in content platforms when the users eventually take over; it cannot function in social platforms that, by definition, require social interaction, which the startup cannot provide without utilizing fake profiles. Thus, it needs users to create social interaction. When the target is content or exchange, the startup is able to generate in-house content or liquidity through market-making. However, UG is essential for social platforms. Therefore, the startup might need other types of solution.

In the context of social platforms, creating fake user profiles is a distinct form of market-making. However, although sometimes utilized by startups, fake profiles are an unethical practice, and will not solve the problem as users will stop using the service when they realize the truth. It also only creates a temporary advantage; the act of registration forms only part of a social platform's strategy, for which high churn rates are detrimental (cf. problem of active use). If initial profiles are fake, they cannot play a role in inviting new users; in the case of fake profiles, the message is not "join" but "beware of this fake site". The major relaxation is when fake sites acquire a constant flow of users through search engines; then, other users' previous experiences do not matter[237]. Therefore, even if creating fake content might fool some less-informed users to join, it is not a stable solution[238].

The platform owner matching the parties mitigates the value capture problem (see Subchapter 3.1.7) as there is no direct interaction between them. However, at the same time, the *modus operandi* is no longer a platform but intermediation, which consequently dissolves the scale benefits associated

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[236] This observation comes from a conversation with a Finnish startup that had successfully reached early adoption, but failed to scale.

[237] Some users, however, have started "anti-fraud" communities that are visible in search results, which might lead to the less-informed becoming informed prior to engaging in interaction with a fake site.

[238] *"We did do a few things to address this, such as including 'random' people and the whole Meetro team in the application. I must say, […] in the end it just wasn't enough."* (Bragiel 2008).

with the platform model (see Subchapter 3.1.4). Thus, market-making cannot scale beyond initial resource investments. For example, an exchange platform cannot keep buying one party's products or it will be a merchant, not a platform (Hagiu 2007). Moreover, it only applies when the startup is able to generate the missing interaction, which is not possible in social sites. If it were, there would be no cold start problem as the startup would merely generate the necessary critical mass. The premise is, therefore, the same as for other solutions that circumvent the critical mass of users/content as a source of network effects and growth. Thus, market-making is a temporary solution, as manual labor relating to match-making does not satisfy the platform definition which is mandatory for obtaining associated scale benefits.

In sum, although market-making can be an acceptable approach in the cold start phase, it is uncertain that the platform will become self-sustainable after absorbing the initial risk of participation. Moreover, the startup providing in-house complements effectively blocks out its complementors, which is why firms such as Intel, Nokia, and Docomo have made organizational arrangements and explicit commitments to assure complementors that the aim is not to steal their business when they are locked in (Evans et al. 2006; Gawer & Henderson 2007).

5.2.12 Marketing skills

A simple solution is to pay for user acquisition; that is, invest in marketing [D]. However, this represents a problem for startups that generally lack funding and marketing skills. To target these shortcomings, [E] planned to invest more next time in marketing and marketing skills. Although marketing was generally problematic for the sampled startups, some proposed novel marketing solutions. For example, [F] speculated on the idea of cross-promotion between users; while it was not successful in this case, it has worked in other contexts[239]. [Q] mentions passion and using one's own product, so that founders actively evangelize their platform in various online communities. In the early stage, this might compensate for the lack of resources and aid getting inspired users on board.

Improving marketing skills differs from earlier solutions in the literature, which emphasize spending rather than innovativeness and skills. For example, Mas and Radcliffe (2011) suggest a three-fold approach: 1) the platform must create urgency, which encourages users to adopt it, 2) invest "heavily" in

[239] Consider Applifier, which created a cross-promotion platform for Facebook applications, and reached 55M users in 100 days (Vesterinen 2010).

marketing for "top-of-mind awareness" in the desired target segment; and 3) subsidize merchants so that they are willing to take the risk of adopting the service[240]. In total, the tactics lead to a "considerable customer acquisition cost" (Mas & Radcliffe 2011), which is only possible when the startup is adequately funded. They are also not directly compatible with UG effects because it is believed that the platform must play a strong role in building and supporting both user bases. Although Mas and Radcliffe (2011) give a successful case example in the context of mobile money, the solutions do not generalize to early-stage online platforms without considerable funding.

5.2.13 Open source

To accelerate the development of the platform, [N] proposed next time to adopt components from open-source frameworks. This approach is close to the remora model, but at the infrastructure level: the startup draws benefit from earlier works of others in creating the platform[241]. Thus, building a proprietary infrastructure can hinder delivery of the business promise [O]. At best, this approach aims to motivate developers of open-source software to directly contribute into the platform owner's technology.

In the literature, Eisenmann et al. (2009) and Parker and Van Alstyne (2008) discuss the *open platform* strategy, whereby the startup acts as a coordinator of the "ecosystem". This is analogous to the concept of coalition, a form of cooperation. Coalition can be defined as a type of governance structure that aims to draw on external resources for the purpose of content production. In the literature, coalitions are given names such as partnerships (e.g., Chauhan & Proth 2005), strategic alliances (Park, Mezias, & Song 2004), syndication (Anding & Hess 2002), horizontal or vertical integration (Lee 2013), and, in some cases, interoperability (Dagger, O'Connor, Lawless, Walsh, & Wade 2007). As suggested by Eisenmann et al. (2009, 137):

> "*[Platforms] may find it attractive to make technical modifications that allow interoperability, that is, cross-platform transactions between their respective users […] When two platforms become interoperable, they become more open: users of platform A can interact with platform B's users, including supply-side users who offer complements."*

[240] In other words, these are marketing-related tactics.

[241] This approach is quite common for Web platforms. For example, Spotify employed open-source modules in its architecture (Teixeira 2012).

Therefore, there is an association with 'open platforms' and interoperability: both can be facilitated through open standards in the supply side (Teixeira 2012), and they might encourage multihoming behavior in the demand side (Economides & Katsamakas 2006). Furthermore, competitive settings influence the degree of openness. In particular, Schilling (2009, 192) suggests that firms can benefit by leveraging open-source communities in inter-platform competition:

> *"[F]irms are sometimes extolled to liberally diffuse their technologies (through, e.g., open source or liberal licensing arrangements) in order to accelerate the technology's proliferation and thereby jump-start the self-reinforcing feedback effect that can lead to the technology's dominance."*

Indeed, an important part of partnering is to notice complements, which have been evaluated as crucial to the success of some dominant online platforms (Parker & Van Alstyne 2008), including Facebook and its *Developer's Platform*, and Twitter (i.e., Twitter API), which actively promote the possibility of developers building applications and content on top of their infrastructure. Complements can also be regarded as an important part of economic theories (e.g., Kaufman 2007) as they support the principal offering and thus make it more valuable for the end user. In the online setting, they include applications running on top of the platform (e.g., mobile apps and Facebook apps), plugins, and extensions.

However, openness is related to some specific challenges; namely, "*opening a platform typically reduces users' switching costs, increases forking and competition, and reduces sponsors' ability to capture rents*" (Parker & Van Alstyne, 2008, 6). As has been previously discussed, by leaving the interaction for user groups to coordinate, it might be difficult for the platform to charge for its services. In fact, in this case it offers no services, merely an "access" to a platform. The issue can be demonstrated by going back to ActivityGifts versus Gidsy (Subchapter 3.1.7): by enabling users to directly contact suppliers, it also opens up a possibility for interaction beyond the platform (i.e., the value capture problem). If this is the case, and customers schedule directly with the supplier, the platform is not able to "internalize externalities" and, in fact, might not even become aware of interaction taking place beyond the platform[242]. For this reason, some platforms' providers employ tactics such as:

[242] Note that even in the case of ActivityGifts, consumers can find the service provider's contact information and negotiate directly. However, this requires more effort as direct messaging within the platform is missing. Further, "price guarantee" (i.e., same prices as providers) sets it financially at par.

1) Hiding email addresses to retain messaging within the platform.
2) Preventing email addresses and phone numbers from being displayed.
3) Prohibiting direct negotiations in their terms of service.

Softer methods that suppliers can utilize are, for example, rankings to signal their quality; (i.e., if a purchase does not take place within the platform, one cannot get a ranking), or direct payment methods with a guarantee against fraud. Value capturing methods are critical for the viability of the platform, as discussed in Chapter 4.6.

5.2.14 Partnering

In retrospect, partnering as a potential solution to the cold start problem was proposed in [K]. Overall, the solution has potential if the startup is able to 1) cover the coordination cost of creating the coalition, 2) govern revenue sharing in a way that suits all parties, and 3) attract the demand-side to cover the expectations of the coalition members. As a consequence, the approach requires talent in network building, negotiating, and understanding "platform thinking". There are startups among the sample that failed at this approach due to not understanding the complexity of platform coordination. As noted by [L], a requisite for solving the problem is to understand the specificities of the platform business model. Therefore, familiarization with the theory of two-sided markets would be useful.

One of the interviewed founders highlighted a willingness to close partnerships with non-profit organizations interested in legal services. Another interviewed startup, matching companies with students looking for part-time jobs, named university career services as one of its best user acquisition channels. The common denominator in these cases was not to approach merely any organization but only to target key organizations for which the platform supply could provide real benefit to their members.

A variation of the partner model is *licensing*, which was mentioned by one startup's interviewed founder as its future internationalization strategy. According to the licensing model, a startup finds a strong local partner to whom it licenses the platform technology, often as a white-label platform that is branded by the local partner. The revenue is then shared between the licensee and the startup. There are at least two levels in this approach:

Strategy A: Licensing to an established, strong partner.
Strategy B: Licensing to an affiliate or local entrepreneur.

Both are utilized; the aforementioned startup aims at the former, whereas some online companies have successfully executed the latter[243]. Licensing to an established partner enables access to greater resources, which is useful for localization and marketing of the platform; for example, an interviewed founder envisaged that a media house would be a potentially useful partner. Another interviewed founder also mentioned teaming up with a media partner as a potential growth strategy. According to his logic, there are two cost sides in advertising: work cost and media cost. Partnering with a media house would immediately eliminate the latter.

Employing the affiliate model, the startup is able to recruit many partners in the same area; if the platform enables niche-creation, the interests of local partners are not in conflict if the niches are not overlapping. The startup can also appoint a so-called "lead affiliate" that manages and recruits other affiliates, also earning a share of their revenue; for example, this strategy is applied by DatingFactory.com.

Generally, coalitions can be structured with or without revenue sharing and different levels of contractual formality (i.e., agreements). Essentially, coordination of partnerships can introduce additional costs for the startup, and might require strategic adaptation (Varian 2003). However, this is offset by their benefits that might include sharing costs of content production, platform development, and marketing (Eisenmann et al. 2009), or they might even replace users as the source of content, in which case users might or might not provide secondary content. Nevertheless, the cold start problem is solved.

Depending on the type of platform, it is noteworthy that partnering might mean recruiting and persuading developers to create complements that facilitate content creation and increase benefits for users. For example, these can be plugins or extensions to the platform. In some cases, the startup might consider "opening" its platform as a form of horizontal strategy. According to Eisenmann et al. (2009), this is associated with 1) allowing *competitors* to access the platform's user base or, in this case, content, 2) allowing partners to be involved in the platform's *commercialization*, potentially by some form of revenue sharing, and 3) allowing partners to participate in the platform's *technical development*. This is close to the idea of creating an ecosystem around the startup that, in its widest meaning, reaches from the online context into the organization, so that the startup actively seeks partners, investors, advisors, and other parties interested in contributing to its success (e.g., Mas & Radcliffe 2011). The idea also links to the platform concept of interoperability,

[243] For example, DatingFactory (www.datingfactory.com) that recruits local affiliates to start their own dating platform by utilizing DatingFactory's technology, which has enabled the company to spread to many markets.

which can also be interpreted as a means to improve collaboration between competing or complementing platforms.

In addition, coalitions can take the form of crowdsourcing to a special platform (e.g., Amazon's Mechanical Turk). This strategy requires less persuasion as the startup essentially pays the crowd for its services[244]. However, some quality issues might arise. Platform startups need to consider both the quantity of content and also its quality, or otherwise risk decaying markets. As formulated by Evans and Schmalensee (2010, 21), "*[i]n the case of direct network effects, the basic problem is that the level of participation on the platform affects the quality of the product it offers to participants, and if quality is too low, participation falls, which reduces quality further, and participation declines toward zero*." In fact, this reframes the problem of content generation to generation of high-quality content. The two can be substantially different, which might be a fundamental reason for the failure of some content platforms.

Coalitions can solve the cold start dilemma if the startup is able to get sufficient participants "on board". However, it is likely that it will have to relinquish power and revenue. Furthermore, monetization needs to be effective or parties lose their interest. In sum, the solution can be effective but requires a considerable amount of coordination concerning content providers (i.e., *community building*), which requires skill in negotiating, marketing, and monetization.

In the case of successful partnering, such as content creators or application developers, a startup will not only solve the cold start problem because complements help to attract visitors, given that marketing is conducted by the platform owner[245], but also solves the monetization problem, given that complements provide enough value for users to pay for them. In this case, the platform needs to be designed as a marketplace rather than relying on freefying as a means to grow the user base and then considering possibilities to monetize. Indeed, sufficient marketing is required from the platform owner, otherwise partners become dissatisfied. Partnering can solve the cold start dilemma, but only on the supply side; the demand side rarely finds content or complements automatically. For example, YouTube has applied revenue sharing through its partnership program, Google shares advertising revenue with its AdSense members that provide advertising inventory, and all major mobile application

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[244] According to Pitkänen and Salminen (2012), four dimensions are important when managing crowd activities: 1) quality, 2) guidance, 3) incentives, and 4) outcomes.

[245] Unfortunately, this is not always the case. As noted by one of the founders (Biggar 2010): *"One part of the service we offered was that we would get the journalist's traffic. Whoops! Getting traffic is really, really difficult. We completely underestimated how difficult it would be".*

platforms offer revenue sharing with more or less the same terms (Salminen & Teixeira 2013).

Moreover, firms can adopt an alliance strategy to prevent escalation of free usage. Instead of competing against each other, firms in one vertical might decide to collaborate. Eisenmann et al. (2009) put forward an example of an online recruitment platform created by three large newspaper groups. The groups formed a joint effort, resulting in lower development costs, content syndication, and avoidance of a mutually destructive price war (cf. 'escalation of free'). Therefore, we can envisage a situation in which shared resources increase the quality of the platform while decreasing competition within an online vertical. In particular, alliances can decrease competition[246].

5.2.15 Scarcity

In contrast to openness, Boudreau and Hagiu (2009) argue that *restricting* user access can, in some cases, increase the adoption rate. This effect is not entirely attributable to the marketing tactic of creating scarcity, or an impression of it, but relates to group dynamics. None of the founders in post-mortems or interviews mentioned this strategy, which, of course, is no reason for it not to be considered.

In particular, if group cohesion is high, new users who identify with the group face a smaller barrier to entry, thereby guaranteeing a speedy diffusion among that particular group. In brief, restricting access can increase the likelihood of relevant connections and avoid interaction with potentially undesirable members. Rohlfs (1974, 19) models the adoption of communication networks and suggests a potential strategy of "*a long-term introductory program, in which the seller gradually expands the size and number of such sets*".

As described by Evans et al. (2006), eBay followed a similar path in 1) first focusing on special niche products (i.e., Pez dispensers[247]), and 2) acquiring the first products itself (i.e., market-making). However, the success of this strategy depends on whether or not users belong to the same community (Rohlfs 1974). Also noted by Birke (2008), negative network effects can result

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[246] In economic analysis, there is a risk of confusing alliance with a cartel. Granted, they share similar traits in that firms in the same industry vertical coordinate their actions in mutual understanding. However, alliance strategy differs in two major aspects: first, it does not infer price setting, but other types of formal cooperation (i.e., joint venture). Second, it is very rare that a consortium dominates an online vertical, in particular considering the general level of competition. Notable exceptions include proprietary content, such as music and cinema, which are protected by intellectual property rights and, therefore, subject to cartel pricing.

[247] Although this classic story was later found to be untrue (see Cohen 2003), eBay did start with collectibles.

when new users join as "*the result of snobbery or vanity*." Therefore, creating scarcity only works if it has meaning other than raising curiosity; for example, controlling the quality and communality of users.

5.2.16 Search-engine marketing

Search-engine marketing (SEM) is typically divided into search-engine optimization (SEO) and search-engine advertising (SEA), which is also known as PPC or pay-per-click (Salminen 2010). Both SEM methods are employed by platform startups. Ideally, SEM is utilized to attract one side of the market as users of the platform, which then encourages users from the other group also to join so that the cost of user acquisition is divided between both sides. Assuming it would cost an equal amount to acquire a user for either side, the cost saving effect *T* can be expressed in the following way:

$$T = cS\left(1 - \frac{1}{S+e}\right),$$

where *S* is the number of users acquired, *c* is the user acquisition cost, and *e* is the number of additional users joining due to *S*. In other words, the cost of SEM actions is reduced by the externality effect of additional users. The same logic applies to advertising as a solution; previously, a proposition was put forward that advertising should result in more than linear growth of the user base to be considered successful.

One startup's interviewed founder mentioned that Google AdWords is the most cost-efficient means to attract users to its platform. Google AdWords also enables the measurement of lead prices and conversion rate. The founder described SEA as "on-demand marketing" because the ads intentionally target keywords relating to the platform's offerings.

The other tactic of SEM is SEO. For example, one startup's founder mentioned that its team has written fifty content articles relating to industry topics to improve their ranking on Google with the terms included in these articles. The rationale is to achieve a position whereby leads flow into the platform automatically from search engines. However, the founder mentioned that lack of in-depth understanding on SEO limits the startup's usage of the tactic. Additionally, although SEO efforts are not associated with costs such as SEA, whereby the cost-per-click is paid to the search engine, they are not free of charge either, as it requires extensive labor to rank high in the search-engine result pages, especially if the targeted keywords are competitive.

In general, the issue with search-engine traffic, according to one founder, is that it is naturally capped; at any given time, there are only a limited number

of people seeking information related to the startup's offering; for example, *"we get five requests for quote a day; it should be fifty"*. In turn, expanding the scope of keywords would reduce the relevance of the search intent, and therefore result in lower participation rates. This problem of natural searches limits the growth of the platform's user base, and therefore the effectiveness of SEM efforts as a solution.

Another issue with SEM is that it is susceptible to remora's curse, in the sense that search engines decide changes to their ranking algorithms independently of the platform startup, and therefore the source of traffic could be compromised at any time. Moreover, it is hard to obtain independence by diversification in the current situation as the market is highly centralized and Google is the natural monopoly of search in Western countries (Salminen 2010).

5.2.17 Sequential approaches

Exhibits in Subchapter 4.5.1 and also [M] indicate that a powerful and potentially cost-effective way of starting a platform business would be to *first* validate the needs of both sides of participants and *then* proceed with developing a specific solution to coordinate those needs (i.e., marketing research → product development). Although self-evident to most marketing professionals, in practice, this is often overlooked by Internet startup founders, as proven by the sample. In regards to company building, there are two alternative strategies:

Strategy A: Build software → contact market sides.
Strategy B: Contact market sides → if commitment, build software.

In strategy A, which is the typical case for both the startups included in post-mortems and the interviewed startups, the team proceeds with an initial idea (i.e., hunch) of matching two or more groups; they assume the idea is great, but fail to validate it and instead start their runway by building the platform. In strategy B, the startup first acquires validation in the form of a commitment, such as a letter of intent, and then builds the platform, which enables the startup to save time: instead of product development, it can utilize a crucial amount of runway time to validate demand, not only in its initial market but in other potential markets that its preconceived platform technology is able to serve.

This logic is in line with Blank's (2010) idea of market risk versus technology risk. Due to the availability of technology, he perceives the former as

more acute for software startups than the latter. Therefore, a two-stage solution can, for example, take this form:

Step A: validate the needs of both sides.
Step B: proceed with developing a targeted solution to those needs.

Validation can become problematic if the founders are subject to confirmation bias or a "reality distortion field", in which they seek to confirm particular assumptions, and therefore might exaggerate either the gravity of customer needs or their willingness to pay. They might also "validate" demand by talking to their friends and family [G] who are probably biased when providing feedback. However, [M] shows a learning approach associated with need validation, in which the founders decided to "take a second try" based on their learning from failure. Based on their experience, they now provide a *separate solution* for both sides of the market. A successful validation might also result in changes in the startup's target users. As noted by one interviewed founder, "*I never thought I would start a company for 40+ [aged] women.*" Another interviewed founder indicated that the startup would move toward separate platform offerings for consumers and enterprise clients as the two groups have distinctive needs.

Additionally, validation bias associated with the aforementioned tactic can be tackled with particular methods; namely, lean startup and customer development. Startup thought-leaders have proposed several remedies for validating demand, most notably Eric Ries' (2011) *lean startup method* and Steven Blank's (2010) *customer development*. Each method, or methodology, aims to minimize the risk of wasteful development by first evaluating the founders' hypotheses and then producing a minimal prototype to solve a customer problem (i.e., *minimum viable product*). A large number of founders throughout the four year research process mentioned these methods and terminology. The methods have spread widely in the startup community and have achieved the status of general knowledge; however, little or no academic research exists on their *actual* application in startup companies.

Another sequential twist is to create first a "killer app", then resell platform resources. This was mentioned by one interviewed founder as an example of strategy employed by Amazon in first creating a dominant e-commerce site, and then offering its resources, including cloud storage/computing, warehousing, and logistics, as services to individuals and other e-commerce companies. In general, the logic proceeds as follows:

Step 1: build a *killer app* (i.e., a standalone offering with very high demand).

Step 2: build a *resource base* to serve the high demand (i.e., economies of scale).

Step 3: productize and *sell access* to the economies of scale.

Relating to which side to attract first, one interviewed founder claimed it is generally more difficult to achieve demand than supply. According to the founder, if the platform shows demand, the supply will arrive. Another founder drew the same conclusion in another interview: "*when the money is there, they [supply side] will join*". A third founder made a similar remark: for them, it is easier to receive quotes from businesses (i.e., supply) than it is to receive requests for quotes from consumers (i.e., demand). This would indicate that the lack of end-user demand forms a greater risk. Therefore, it can be proposed as a tentative rule:

Proposition: In a B2C-oriented platform, securing demand is a greater risk than securing supply.

Consequently, one of the interviewed founders expressed the following sequence:

Step 1: employ B2C marketing to get consumers to join on the demand side.

Step 2: employ B2B enterprise sales to build the supply side.

Step 3: optimize platform features to ensure consumers transact with suppliers.

With one interviewed founder, it was discussed how his startup defines the critical mass in one city before moving to another; the goal being first to build a critical mass of suppliers before moving on. The founder mentioned that, although the startup lacked a formal instrument, this is quite easy in Finland as each city has such a limited number of suppliers. This led the author to conceive an instrument termed *critical mass ratio* (i.e., critical mass ratio = closed suppliers ÷ all potential suppliers). Accordingly, it follows that it is seemingly faster to accomplish critical mass in a smaller local area than a larger one. Although the notion of critical mass manifests with regard users' to needs, wants, and preferences (i.e., it has a qualitative dimension in addition to its quantitative dimension), it is generally assumed that variety and selection follows somewhat automatically by the addition of supply-side members. Therefore, reaching a higher critical mass ratio is a means with which to increase the supply side's attractiveness (as an aggregate) to the demand side (as an aggregate).

As discussed earlier, one of the errors made by electronic marketplaces during the dotcom era was to assume an infinite supply; that is, that each provider would be interested in joining their marketplace. In reality, this was not the case, especially when the platform offered no means to differentiate except price. It can be easily concluded that joining such a platform is feasible only to the price leader. One of the interviewed startups had solved this issue eloquently with a strategy termed "*first in, first to win*". According to this strategy, only the first three bids from supply-side actors are accepted, which effectively restricts competition and rewards the platform's most active supply-side users. This solves the "infinite list" problem of e-marketplaces: instead of being added as one of tens or hundreds of suppliers, at the end of an "infinite list", the firm is among the top three, increasing its chances to win the bid[248]. In addition, the strategy is intended to influence consumer choice: once the three bids are received, the information is passed to consumers via SMS, after which decisions can easily be made from a limited number of suitable alternatives, thereby avoiding the "paradox of choice".

Another ratio that came to mind during a discussion with one of the founders is termed *supply to demand ratio*, which equals the number of supply side users divided by the number of demand side users. It is documented here because the author was unable to find a similar approach in the literature. It is clear that the balance between supply and demand sides impacts the viability of the platform. The more there is supply for demand, the more feasible the platform is for the demand side (*ceteris paribus*); and *vice versa*. Of course, this argument is directly derivable from the notion of network effects (see Chapter 3.1). However, to the author's knowledge, the ratio instrument has not previously been presented. In addition to employing the ratio to maintain balance between the two sides, startups might want to monitor it to curb negative effects of intra-platform competition; for example, having too many suppliers in relation to demand side users reduces the motivation for supply-side members to participate.

Sequential approaches have also been considered in the literature. For example, Facebook's success is often explained through the *bowling pin* strategy, aptly described by Dixon (2010), according to which Facebook was able to capture a large market by initially targeting a carefully chosen niche, that is, students at Harvard University, while preventing other users from joining, which made the initial members much more relevant to members of this particular institution compared to an average "open" social network (Boudreau &

[248] The idea was copied from another platform operating in the same industry in another country; this suggests that founders can benchmark players in other markets and learn from their best practices, while being aware of transferability problem and reference point bias.

Hagiu 2009). It is noteworthy that although the approach resembles the marketing strategy of creating scarcity or an impression of it, for example, in the form of offers and the purpose of triggering psychological pressure for immediate action, the key to the method is that it increases one-sided positive network effects while minimizing negative externalities (e.g., fake profiles or harassing users).

Piezunka (2011) mentions the sequential approach by which a startup first focuses exclusively on one of the sides. This solution suffers from circular logic as it returns to the question concerning how to get the first side on board. Consider Piezunka's (2011) example of Google first attracting users to its search engine before courting advertisers. Moreover, Hagiu and Eisenmann (2007) observe that the platform can employ a staged strategy by offering services to one side independent of the other side. Then, after acquiring sufficient users for its stand-alone product, it can begin to develop the two-sided market. The idea is to break the necessary inter-dependency of sides in a two-sided market by first creating a one-sided market. Hagiu and Eisenmann (2007) state that this was Google's strategy and, that by amassing a large base of searches, it was able to develop into a platform by adding new functionality (e.g., AdWords for advertisers).

Piezunka (2011) also mentions the use of prospective ties: the startup gets a promise from group A that if group B joins, A will follow. Then it will do the same for B, C, and others; when one group participates, all others will automatically follow in a *domino effect*. This approach is advocated by Evans (2009a) as a form of zigzag, depicted in the following figure.

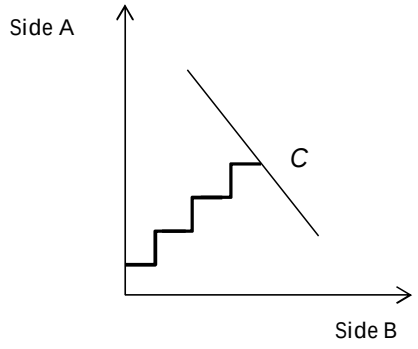

Figure 16 Zigzag to a critical mass (Evans 2009a)

More precisely, Evans (2009a) mentions pre-commitment by *pledges* as a solution. Pledges are based on recruiting new prospects based on commitments (i.e., promises) of earlier prospects. For example, prospect A

agrees to join if prospect B joins; then B is alerted to A's pledge, upon which its risk to commit platform-specific investments without getting anything in return decreases, and it is more likely to join. Especially in cases where there is significant asset specificity and, therefore, a potential hold-up problem, assuring pre-commitment from both parties prior to joining might be an effective mechanism for solving the cold start problem[249].

However, pledging does not answer the question concerning which party to attract first; it is a description of a process leading to a critical mass. Further, it cannot be applied when the number of participants increases. For example, in the case of an Internet startup, when the platform owner needs to negotiate with thousands or more individuals to get their pledges to join, the approach is problematic; it becomes too costly and unfeasible, whereas it might be realistic in a B2B setting with a handful of large parties. Further elaborations can be made by studying platforms that enable pledging (e.g., crowdfunding) or by thinking of connected individuals who could be converted as ambassadors for the platform. However, currently the solution is unsatisfactory.

In general, staging requires considerable resources in first building the stand-alone product and then the two-sided functionality. Furthermore, if the stand-alone product fails, this might not necessarily refute the business idea of the two-sided market. Indeed, the argument returns to the problem's definition rather than providing a solution, unless changing the two-sided market to one-sided, in which the other side does not matter. Moreover, the *transference problem* implies that diffusion in one group does not guarantee diffusion in another group if there is a similarity that effectively negates the network effects gained in the first community (see Subchapter 4.5.1). The bowling pin strategy assumes a relationship between niches. If this is not the case, as in the transference problem, conquering new niches requires starting from zero. In other words, there are no network effects between niches.

Although the startup can gain learning effects from a success in one niche, the solution will not be satisfactory in launching the necessary self-propagation if the learning effects do not generalize. For example, Facebook required considerable funding to reach its current scale; thus its story as a perfect exemplar of the bowling pin strategy includes simplifications (i.e., the survivorship bias).

[249] The hold-up problem does not exist if contracts are complete, or if there is no incentive for the "holder" to deviate from the original agreement (Klein 1998).

5.2.18 Standalone value

There is a choice of pivoting away from the content platform and perhaps to opt for another model, as proposed by [P].

One of the interviewed founders also subsequently decided to move from the platform owner's position to blog writer, creating content and directing the audience towards a freelancer platform: for each visitor, she collects a fee on the pay-per-click basis. The reason for this pivot was that she realized building a platform by herself would be an overwhelming task. In relation to this change, she also demoted the project to a side project.

Standalone value and network value are not mutually exclusive (McIntyre & Subramaniam 2009). Although trivial, this statement opens an avenue for solutions to the chicken-and-egg problem in platforms, as the startup can aim at first creating a successful standalone product, and then transform it into a platform. Such a strategy was applied by one of the interviewed startups. The alternative approaches of these two interviewed startups are, therefore, as follows:

Strategy A: create a standalone product → transform into a platform.
Strategy B: start with a platform → pivot into a standalone product.

Both strategies rely on providing intrinsic stand-alone value in addition to or instead of network value, thereby eliminating the cold start problem because the platform would function as an independent 'product'. The idea is logical, as network effects do not emerge without the network. Therefore, building the business model with this consideration can grow the pool of solutions.

However, in strategy A, complications might arise when converting the extant user base to the platform setting; there is no guarantee that their interest in the standalone value will be accompanies by interest in the network value. In other words, it is unclear whether network effects emerge when the startup pivots to the platform model. Hagiu and Yoffie (2009) note that this was the case for Google, although it is probably not the case for all startups.

As a result of pivoting away from the platform model (i.e., strategy B), a startup can try to break its dependence on UG and network effects, and focus on offering a stand-alone product as opposed to a platform. However, this leaves an open question concerning whether the startup can pivot to the platform model when one side has been secured. In sum, pivoting does not represent a solution to the cold start problem but, rather, a way of avoiding it.

5.2.19 Performance-based compensation

To solve the chicken-and-egg problem, Caillaud and Jullien (2003) propose that platforms can charge based on transactions instead of registrations. This is not equal to subsidization as both parties can be charged. Their idea is useful when considering the monetization dilemma: the startup only gains revenue if there is interaction. Furthermore, it can generalize over exchange platforms; for example, in dating services, one would only pay for successful matches. Performance-based compensation was also applied by most of the interviewed startups: users only pay for successful matches.

The drawback of this tactic is, however, that it does not solve the cold start problem under the typical assumption: if the platform is empty, there is no incentive to join, regardless of the price. In fact, not charging users can hinder attracting users if the startup is unable to employ paid user acquisition to get either side on board. This paradoxical situation can be seen in some of the sampled startup cases[250].

5.2.20 Personal selling

Personal selling is a common strategy in B2B markets. The methods applied by startups for personal selling, based on the interviews, are the following:

- Direct contacting by email (often)
- Direct contacting by phone (often)
- Meetings (rare).

Most often, founders seem to contact their prospective enterprise users by emails or phone calls. Oddly, *introductions* as a means to reach decision-makers were not mentioned in the interviews; the approach mode adopted by the interviewed founders is therefore most often cold calling or cold emailing. Although cold contacts seem to be the most frequently employed approach, there seems to be a strong discrepancy in their effectiveness; one of the interviewed founders argued that cold contacts work well for them, whereas another founder perceived them among the startup's least effective user acquisition tactics.

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[250] *"We would only have been successful by making successes of journalists. To be able to run NewsTilt successfully, at least 20 journalists would have to be making a full living from it. To be able to get rich, we would have needed at least 1,000 customers making a living. That's not exactly taking advantage."* (Biggar 2010). Lacking funds to acquire end users might have been a bigger issue than charging for participation.

In addition, the potential use of *lead filtering* was discussed with one founder as relying on two stages: 1) evaluating the value of the lead (e.g., by contracting a third-party calling agency), and 2) contacting only the most valuable leads. Meetings seem to be rarer, at least in the interviewed startups. One founder explained that meetings are avoided as traveling is costly and that, to date, the platform has been easy to sell due to free access. However, the author met a Finnish founder in San Francisco and discovered that she was traveling around the world to find potential clients for the platform's demand side and students for the supply side; the platform was intended to match companies offering project work and students willing to take these jobs. The specific strategy was to find pilot customers.

A recurring theme in B2B platform interviews was the use of pilot cases. The process is often as follows:

Initial contact → Pilot case → Conversion to paid customers

Following initial contact by email/phone/meeting, the client is persuaded to join a free pilot case. If the platform performs well, the client is persuaded to continue its usage as a paid customer. There is typically a lot of "hand holding" during the pilot phase as the startup wants to ensure the client's satisfaction. The rationale of this testing phase is to eradicate low willingness to pay by asking the client to test the platform, keeping in mind the scaling opportunity of the business. In other words, in the short term, the startup is prepared to sacrifice returns in the expectation that the client will be willing to pay after the platform provides high-quality matches.

Relating to personal selling, the importance of proper communication of the platform benefits became obvious in the interviews. One interviewed founder pointed out the importance of clearly defining the *unique sales proposition* (USP); in the case of this startup, it was to cut costs for companies by hiring freelancers and sharing saved labor costs with the platform owner. Another founder, whose startup attempts to enable interaction between lawyers and potential customers, pointed out that the former have a hard time adapting to the platform mentality as their marketing has established rules they do not want to break. Additionally, they are not familiar with online business. Thus, in some cases, there exists a type of *information asymmetry* between market sides and platform owners that the startup needs to bridge by communicating the benefit of its platform technology in providing the correct matches. Analogies such as "modern phonebook", mentioned by one of the interviewed founders, can be employed to address cross-informational and generational gaps.

In the interviews, it was discovered that subsidization seems to work in relation to personal selling, whereas several startups in the sample applied self-service selling (i.e., automated sales process on the Web). Therefore, a proposition is put forward:

Proposition: subsidization is a more effective solution to the cold start problem when coupled with personal selling than it is with automated selling.

However, the difference might simply be attributable to another cause; namely, that personal selling in general is more effective than automated selling. In addition, even if true, the proposition does not relinquish its relation to the monetization dilemma. Moreover, the issues of personal selling include poor scaling as accelerating the user acquisition rate requires more sales force which is expensive, incompatibility with B2C platforms, and a generally high user acquisition cost.

5.3 Summary and discussion on solutions

In the previous section, solutions for the identified problems were considered. It was discovered that many solutions require substantial resources, and do not fit particularly well with the startup condition characterized by a shortage of resources (i.e., time and money) and negotiation power to attract complements by employing tactics such as exclusivity.

The solutions discussed in the previous sections are contrasted with each startup dilemma in the following table.

Table 29 Evaluating applicability of solutions

	Cold start	**Lonely user**	**Monetization**	**Remora**
Advertising	x			x
Aggregation	x			
Community		x		x
Exclusivity	x			
Facilitation		x	x	
Funding	x			x
Get big fast	x			
Influencers	x			x
Legitimacy	x			
Market-making	x			
Marketing skills	x	x	x	
Open source				
Partnering	x		x	x
Scarcity				
Search-engine marketing	x	x		
Sequential approaches				
Standalone value				
Performance-b. compensation	x		x	
Personal selling	x			x

As can be seen, the solutions tend to consider one problem without addressing other problems. Advertising might solve the cold start dilemma without the need for a host platform, but aggravates the monetization problem as the required lifetime value of users increases. In a similar vein, acquiring funding might aggravate the monetization problem, as investors put pressure on the platform owner to show returns. Nevertheless, advertising can be employed to acquire users and avoid remora's curse. Similarly, in aggregation, the startup puts itself at the mercy of the host platform from which the content originates.

Methods such as aggregation, exclusivity, and scarcity might solve the cold start problem in terms of volume of users/content, but they do not forcefully lead to sustainable levels of interaction and have no guaranteed impact on users' perception of value up to a point where willingness to pay is achieved. In addition, community-based strategies, which target high engagement rates, are susceptible to the chicken-and-egg logic: interaction attracts a community, but how can a community be attracted without interaction? The same flaw in logic applies to the facilitation of interaction: it requires the interaction to be facilitated.

Furthermore, obtaining a critical level of interaction (i.e., critical mass) does not guarantee a stable solution. Sequential approaches, more precisely, rely on theoretical network effects after reaching a critical mass of users/content; should they fail to materialize, the lonely user problem would quickly eradicate these solutions.

Improving marketing skills and business competence can be seen to have benefits on many fronts. First, they lead to innovative ways to solve the cold

start problem. Second, market-oriented founders understand the principles of customer engagement, and therefore pay attention to customer engagement and interaction metrics, and create value to improve them. Third, marketers acknowledge the ratio between customer acquisition cost (CAC) and customer lifetime value (CLV), and therefore focus only on such features and offerings for which users are willing to pay.

The major downside of this solution is that it is indirect and uncertain. By becoming more proficient at business, founders are better able to solve business problems. This, too, is more a tautology than a prescription for solving imminent problems. The same condition influences other methodological solutions, such as lean startup and customer development methods.

Open-source based solutions address openness and more rapid development of a platform, but these are not the reasons why users join a platform; a technically perfect platform remains useless without an active user base. Partnering, therefore might be effective; for example, platform startups can "swap" users in collaborative cross-promotion arrangements while engaged in revenue sharing and retaining independence over dominant platforms. Partnering, however, does not solve the lonely user dilemma.

Search-engine marketing aims to solve the cold start problem through ranking high in search engines; under its premises, reducing the customer acquisition cost through free traffic alleviates the monetization dilemma, although not solving it because the dilemma does not only address costs but also willingness to pay. To some extent, SEM can be seen to mitigate match-making problems in content platforms as search engines make relevant content available at any time. However, the solution maintains a close connection with search engines and, therefore, becomes vulnerable to remora's curse. In addition, its effectiveness is reduced by the natural cap of searches in each vertical.

Performance-based compensation has potential as a solution only if it is assumed that users trust the platform to solve their match-making problems and thus join, after which the platform actually is able to solve them, thereby negating lonely user and monetization dilemmas. However, in practical settings, this assumption is often unrealistic as users tend to be skeptical about new unproven platforms.

It is difficult to find a perfect solution. Can one be characterized? Solving the cold start dilemma and associated problems seems to require answers to the following questions:

1) What is required to reach a critical mass of users or content?
2) What is required to keep users active?
3) What is required for users to propagate the service?

4) What is required to monetize the platform (i.e., “internalize externalities”)?
5) What is required to remain independent of host platforms?

Consequently, the ideal solution would solve the cold start problem in a sustainable way, corresponding to the following requirements:

1) The platform interaction is *self-sustaining*, so that
2) matches can be produced *at any time*, place, and fulfill other conditions needed by a user through
3) *financially feasible* user acquisition and service costs, and
4) *a plausible* model for revenue generation to cover the aforementioned costs, while maintaining
5) *independence* over integrations to host platforms that would endanger the platform owner’s *control* over the platform’s user groups.

The first requirement rules out market-making and other temporary solutions as they do not guarantee user engagement. The second requirement solves the lonely user dilemma by an “omnipresent supply” of interaction. The third and fourth requirements rule out the monetization dilemma and paid user acquisition with negative lifetime value projections, while retaining profitability. The fifth requirement avoids remora's curse.

One construct, a “total solution” can be built based on the chapter's solutions, and its merits contrasted to these requirements. A sequence of applying all of the considered solutions would be as follows:

(0) Acquire **funding** to
(1) **advertise** cost-effectively to
(2) **get big fast**, while developing
(3) **legitimacy**, **exclusivity**, and **partnerships,** especially with **influencers** and **community**, and
(4) deploying **open source**, **aggregation**, and **SEM** to accelerate speed-to-market and user acquisition according to the
(5) principles of **sequential approaches** that focus on
(6) initial **market-making** with **performance-based compensation**, potential **scarcity** effects, and
(7) improvements on the platform's **standalone value**, **interaction-facilitating** features, and also
(8) **personal selling** and **marketing skills**.

As can be seen, a total solution such as this becomes complex and does not necessarily fulfill the defined requirements; both financial sustainability and self-sustainability of interaction is hard to build in by proposing exogenous strategies. In particular, the solution does not consider potential UG effects. Although the ideal model was criticized as unrealistic, the scaling of some of the dominant platforms prove its effect; for example, consider that Facebook only has one developer per one million users, which is a clear indication of a working UG model (Spulber 2010).

However, the reality of the studied platform startups, or startups in general, is not clear-cut, clean, and neat, either. Rather, many of the startups apply ad-hoc solutions and try to solve problems as they appear. The fact that the solution space is fragmented calls for more research on the topic.

Based on examining various solutions, it is possible to learn more on their potential nature. First, solutions can be perceived as either *temporary* or *permanent*. In temporary solutions, a startup provides the initial boost needed to reach the correct type of users who begin contributing, after which the startup will focus on improving platform functionality and managing inter-platform competitiveness instead of market-making. Ideally, this market-making approach initiates an organic process, whereby users are "lured in" by the premade content and then join to create additional content on their own terms. This content leads to the benefits of the ideal UG model.

Permanent solutions are structural; for example, the selection of freemium as the business model aims at constant generation of conversions and revenue. Diversification is also a permanent strategic selection, although participants in the supply-side network might change. A remora can be either permanent or temporary, although the risk of strategic conflict is greatest in its permanent form. In a temporary form, a startup can feed from remoras and then gain independence. These methods are termed content envelopment and value envelopment.

Second, because critical mass is not a static entity but changes in platforms over time, solutions can be perceived as either *stable* or *unstable*. A solution is not stable if the platform is unable to maintain matches across locations and time points. Even if the installed base of users shows tremendous growth, and if temporal and spatial fragmentation is sufficiently wide, the lonely user dilemma remains a potential issue. Clearly, a startup is somewhat able to constrain the risk of fragmentation by narrowing its focus, which is essentially what is suggested, for example, by the bowling pin strategy. Unstable solutions are characterized by negative outcomes. For example, if adding monetization removes liquidity, the solution to the chicken-and-egg problem is not stable; if a lot of users register but few are present in the time and place needed for match-making, the solution is also unstable.

Overall, it is interesting to see how startups aim to bridge the lack of resources to the need for marketing. Essentially, startups aim to compensate for a lack of funds with innovation "passion". Clearly, analytical modeling could consider some of these strategies. It can also be stated that the platform literature rarely considers these creative solutions. In particular, improving marketing skills was perceived as a solution not offered by the extant literature. Startups also employ many more tactical solutions, such as "fake till you make it", "growth hacking", and "evangelization", than are considered in the literature. Researchers often overlook such approaches due to their finesse and granularity. Founders or ex-founders, who are closer to practice, can therefore propose solutions that are not included in the platform literature. In contrast, theory can increase the level of abstraction and help to understand why particular approaches are more efficient than others, and so the following win-win situation can be framed:

Platform theory → new and creative solutions
Platform practice → systematic analysis of new and creative solutions

The application of a *method* or process as opposed to standard "one size fits all" solutions is a creative way of considering solutions. Following particular basic rules and principles embodied in the lean startup and customer development methods, a startup is supposedly able to solve problems in its special context, thereby avoiding the problem faced by universal solutions when placed into contexts that are not compatible with their premises. Although these two methods have not been developed specifically with platform startups in mind, they have been developed for use by software startups, which increases the applicability of their approach. In software settings, rapid prototyping and testing is often faster than in other startup settings that require a longer R&D cycle. Consider, for example, a cancer cure with a zero market risk, which undoubtedly every patient would buy, but product development risk is high; for example decades can be spent on finding a solution, and even then there is no guarantee that one will be found. According to Blank (2010), online startups face a higher market risk than technology risk, and therefore should "get out of the building" to validate their idea before building the product (i.e., platform).

Ries (2011) put forward another central idea of "minimum viable product"; that is, the smallest, easiest to create concept that can be employed to solve the customer problem, after its existence has been properly validated. The idea is that instead of building a ready product, the team first works on small prototypes to test whether their approach to solving the problem is correct. In so doing, they avoid adding unnecessary features that please their own desire to

create more than contributing to solving the customer problem. However, launching an unfinished platform complicates the matter. Farrell and Klemperer (2007, 2025) refer to this as the "death spiral", whereby "*low adoption persuades others not to adopt*". This is essentially the reverse form of positive self-reinforcement. The platform scholars' argument is that if the early adopters are not convinced, later adopters will take this as a negative sign of credibility. The trick is, therefore, to balance the product development and market validation efforts; the former need to be sufficient to discover whether the platform is able to fulfill its core task of producing matches, while the latter need to verify if there is a lucrative business opportunity in a given space.

6 CONCLUSIONS

6.1 Theoretical contribution

6.1.1 Addressing research gaps and questions

This study sheds light on platform-specific problems and provides theoretical and managerial insight. Founders can employ such knowledge when planning their platform business, investors when assessing the feasibility of investments, and scholars when continuing research on the strategic management of platforms.

Research gaps identified in Chapter 1 are addressed as follows.

Table 30 Addressing research gaps

Research gap	**Contribution of the study**
Not much is known on platform-specific problems beyond the chicken-and-egg problem.	The study expands knowledge on platform-specific strategic problems by introducing the monetization dilemma and remora's curse.
The perspective in the platform literature often neglects the startup condition, mainly regarding the lack of resources or pricing power.	The study considers specificities of online startups: different types, emphasis on user generation effects, and use of indirect monetization.
Most studies relating to the chicken-and-egg problem are theoretical.	As far as the author knows, the study is the first of its kind as a grounded theory analysis focusing on multiple cases.
The chicken-and-egg problem is typically treated as an isolated problem without deeper scrutiny on associated problems relating to its antecedents, or arising from its potential solutions.	The study divides the chicken-and-egg problem into the cold start and lonely user dilemmas, which correspond to its nature in online platforms. Furthermore, it associates them with the monetization dilemma and remora's curse.
Strategic solutions considered by the economist-dominated platform literature are narrow and focus mostly on pricing.	The study reviews the literature for solutions, and presents alternatives grounded in the empirical material, while downplaying the role of pricing.

The research questions are answered as follows:

Table 31 Answers to research questions

Research question	Answer
What strategic problems are encountered by early-stage online platforms?	Several problems are encountered, including generic business problems, startup-specific problems, and problems associated with the platform business model.
How can the problems be conceptualized as dilemmas?	Platform-specific problems were conceptualized as the cold start dilemma, lonely user dilemma, monetization dilemma, and remora's curse. These dilemmas also have associated problems.
Are the dilemmas interrelated? If so, how?	Dilemmas *are* interrelated; thus, solving cold start/lonely user dilemmas by subsidization leads to the monetization dilemma, and solving them by the remora model (i.e., strategy similar to envelopment) leads to remora's curse.
How can the platform literature and founders' experiences help solve the dilemmas?	The platform literature is highly useful and applicable in solving the dilemmas, as are founders' experiences. However, no definite cures were found, emphasizing the need for strategic platform thinking.

To the author's knowledge, this study is the first to employ a grounded theory (GT) approach to examine a relatively large number (N=29) of platform startups. Utilizing GT as a method has enabled the study to depict a comprehensive perspective on the strategic problems of platform startups. It is also unique in its focus on failed platform ventures and multiple problems, as earlier studies have focused on the chicken-and-egg problem and overlooked associated problems.

The study identifies four dilemmas to which early-stage online platforms are subject: 1) cold start and 2) lonely user dilemmas as special cases of the chicken-and-egg problem, 3) the monetization dilemma resulting from the difficulty of charging for a product and simultaneously attracting users in an environment of hypercompetition, and 4) remora's curse, whereby a startup integrates with a larger platform while losing strategic decision-making power in exchange.

It is argued in this study that the analyzed dilemmas are interrelated. As such, given particular assumptions, solving one dilemma leads to an emerging problem of another kind: in particular, the monetization dilemma as a

consequence of applying subsidization as a solution to types of chicken-and-egg problem, and remora's curse as a consequence of applying integration/envelopment as a solution to chicken-and-egg problems. As these solutions are commonly applied in the industry, bringing them to researchers' attention in this particular sequence forms a theoretical contribution.

The following subchapters explore the theoretical contribution in more detail.

6.1.2 Expansion of the chicken-and-egg problem

This study contributes to the platform literature by expanding the scope of the chicken-and-egg problem to forms more suitable to online platforms. It expands the problem by 1) dividing it between cold start and lonely user dilemmas, in which both time and the nature of interaction influence the emergence of matches between the market sides, and 2) connecting it to a larger perspective including other associated strategic problems; namely, the monetization dilemma and remora's curse. Therefore, based on the present study, the chicken-and-egg problem is not isolated but linked to other problems that emerge in the online context.

The cold start and lonely user dilemmas are related to the chicken-and-egg problem in the two-sided market literature; that is, acquiring a critical mass of users to enable participants to conduct meaningful interaction. In this study, a distinction is made between static content and dynamic social interaction as a basis for determining critical mass and, therefore, the nature of the chicken-and-egg problem and its solutions. Consequently, the chicken-and-egg problem can be divided into the cold start dilemma, which is associated with static or permanent content, and the lonely user dilemma, when the interaction is perishable. Solving the lonely user dilemma is complicated by complexities in providing liquidity; most typically, both parties need to be present at the same time, although other match-making criteria such as location and compatibility of mutual preferences can exist.

The coordination required for match-making differs in these two cases. Thus, for matches to be created, static content is always available and therefore easier to provide as supply for requests of the demand side, while social interaction requires the simultaneous presence of users, potentially with matching location and preferences. Although the problem can be alleviated by methods such as offering a message inbox, finding a solution is more complicated in real-time social platforms, and even more so if they are location-based services. In such cases, aggregating users from both sides does not provide a satisfactory solution as it might for a cold start; however, the coordination

problem is more vexing and requires innovative solutions, some of which have been discussed in this study.

6.1.3 Interrelatedness of platform dilemmas

The main contribution of the study is summarized in Figure 15 (p. 195), which demonstrates the associations of strategic platform problems. This model offers a dilemma roadmap for understanding the problems of early-stage online platforms, which is useful for managers and scholars involved in platforms. In particular, if the startup chooses to adopt subsidization by giving free access to and usage of its platform, it might solve the cold start dilemma, although this is not always the case according to the study, but faces the monetization dilemma as a consequence. Moreover, it might choose to integrate with a larger platform (e.g., via APIs), although becoming subject to remora's curse in return. In relation to these dilemmas, there are associated problems that are typical to online platforms, and can be seen in the Figure 15.

The importance of this argument can be understood through its implication: if strategic problems are interrelated, treating them as isolated is harmful in both theory and practice. First, researchers would ignore important associations and thus risk drawing the wrong conclusions, and, second, managers focusing on one problem at a time fail to grasp the big picture of their decision making. As previously argued by strategic management scholars (e.g., Lyles & Howard 1988), although not considered to date in the platform literature, strategic problems are often interrelated. For example, platform theorists such as Evans (2002), Caillaud and Jullien (2003), and Rochet and Tirole (2005) have spent significant effort on studying the chicken-and-egg problem; however, mostly considering it in relation to other strategic problems. This tendency is understandable as cross-group externalities play a major role in the theoretical assumptions of platform theorists, and the chicken-and-egg problem is undoubtedly a common denominator across different platform types.

However, at the same time, focusing only on this one problem 1) depicts an incomplete picture of challenges faced by platforms, and 2) might prevent the discovery of solutions because their consequences are not fully considered. The analysis of this study's material, suggest that the chicken-and-egg problem is associated with a larger set of problems. Although this study explicates specific interrelations in the field on online platforms, other types of interrelation are likely to occur in different contexts. In other words, the usefulness of platform research would increase by adopting the strategic management principle of problem interrelatedness, as opposed to treating the problems as

isolated cases. Therefore, well-founded platform studies should consider possible interrelations in their analyses.

6.1.4 Strengths and weaknesses of common solutions

The extant platform literature has considered the chicken-and-egg problem mainly as an isolated coordination problem that can be solved through pricing strategies (Hagiu 2006; Gawer 2009). This study adds to the platform literature by providing knowledge on its existence and nature in online markets, and presents solutions that are compatible with previous theory, and also new insights from founders who have faced the problem first hand.

To illustrate this contribution, a typical approach to the chicken-and-egg problem is cited (Evans 2002, 2):

> *"[P]rice levels, price structures, and investment strategies must optimize output by harvesting the indirect network effects available on both sides. By doing so, businesses in two-sided industries get both sides on board and solve the chicken-and-egg problem."*

However, according to this study, there are at least two exceptions to these rules. First, price levels cannot be employed as a solution when the platform owner cannot influence them. For example, consider Google: the first side (i.e., users) is offered free access, and the second side (i.e., advertisers) coordinates through an auction market[251]. In a platform where access fees are zero and price is based on demand, the platform owner does not dictate price levels.

Second, earlier platform research has neglected the negative effects of subsidization and focused on its positive impact in terms of cross-group effects; however, the linkage between cold start/lonely user dilemmas and the monetization dilemma shows that subsidization is not a harmless strategy for startups. In fact, if it is applied as a common strategy across online verticals, so that a startup's choice of the freefying strategy is sequentially followed by other startups, a "race to the bottom" might occur that reduces the potential of these firms to generate profits.

Third, as illustrated by the sample of failed startups, a firm might set a zero price and still fail to solve the cold start dilemma. Many online platforms grow or fail regardless of pricing, as price is not the only factor influencing adoption. Therefore, pricing alone cannot solve the cold start dilemma, and the

[251] The notable exception, however, is the AdSense program whereby Google applies revenue sharing and therefore decides pricing. However, for AdWords, which generates the majority of the revenue, pricing is coordinated by its proprietary competitive dynamics, not the platform owner. Second, Google does set a minimum price for bids in its ad auction.

literature needs go beyond price, as this study exemplifies by considering a variety of interrelated problems and strategies for their solution.

The second part of Evans' (2002) argument, price structures, refers to a platform "*internalizing the externalities between the two sides*" (Evans 2002, 10). This can be considered the outcome of correct strategic choices. Google is again a strong example: it provides network benefits to users seeking information by indexing the majority of the Web, with content being Google's complement, and providing fast and accurate results through its search algorithm. As such, Google provides an opportunity for advertisers to reach end users, enabling them to match user intent with advertisements compatible with that intent. The cost-per-click is the price that Google collects from advertisers in exchange for providing this coordination.

However, it is argued here that the solution to the cold start problem is not in the price structure *per se* but in the business choices prior to it; namely, in superior aggregation and sorting mechanisms (e.g., provided by the Google platform), and also its ability to maintain high quality interaction (e.g., advertising in Google's case). This is a crucial notion, suggesting that a superior product can overcome optimal pricing structures and even network effects of dominant incumbents. Through this argument, for example, it can be understood why Google replaced Yahoo, and Facebook replaced MySpace as industry leaders despite the incumbents' dominant positions. Therefore, strategies with which to solve the chicken-egg problems in platform markets extend beyond defining a price structure as this comes, in fact, after securing participation.

The third part of Evans' (2002) argument, investment strategies, applies to some extent to online platforms, *but* it ignores the startup condition. As Mas and Radcliffe (2011) report, marketing investments for the purpose of buying users can effectively secure a critical mass. However, as this study's analysis has shown, rapid expansion can lead to the monetization dilemma if the platform startup is unable to monetize its services indirectly or convert sufficient free users to the premium version. Consequently, a discrepancy is perceptible between applying the marginal cost of distribution (i.e., information goods theory) and the investments made in a dual-sided setting (i.e., platform theory). Essentially, the discrepancy can lead startup founders to undervalue their platform or, in some cases, not implementing a revenue model at all. This, it is argued in this study, is detrimental to their survival.

Moreover, the study's analysis shows how envelopment (Eisenmann et al. 2011) can lead to remora's curse, and discusses the limitations of multihoming (Armstrong 2006) and subsidization (Rochet & Tirole 2003). These strategies are commonly considered in the platform literature, but often without an empirical grounding. This study presents empirical evidence found on platform

startups, and thus offers insight on the strengths and weaknesses of these proposed methods.

In particular, this study has identified two modifications to the envelopment strategy proposed by Eisenmann et al. (2011). These are the so-called 1) content envelopment, whereby aggregation is employed to generate content for a limited time while the platform otherwise remains independent, and 2) the so-called value envelopment, whereby the startup platform exploits the host to drive free users to its own platform, and then monetizes them without sharing revenue with its host.

Multihoming, as noted in the extant literature, is a possible strategy in both the demand and supply sides (e.g., Evans et al. 2006), as diversification into many platforms might reduce a startup's dependency on one platform. However, the literature examines it quite narrowly and does not consider 1) the different degrees of interaction; for example, only utilizing marketing platforms versus integrating the product into the host, or 2) the direction to multihome, either outward or inward. For example, a startup can leverage a host only as a marketing platform, or undertake forms of selective integration whereby the host's technology is only partially applied.

The complexity of the actual business environment on the Internet exceeds parsimonious solutions and, although such solutions might occasionally rise to stardom, their longevity is likely to be cut short by ongoing dynamics. Without understanding the overarching strategic conditions in platform business, knowledge on platforms remains spurious and over-simplified. In contrast, understanding and also internalizing the specificities of platform dilemmas leads to truly applicable and useful knowledge for the managers and founders of these businesses.

The study also considers solutions derived from post-mortems and the literature. The conclusion is that a "magic bullet" solution that would definitely solve the problems without a possible counter-effect is not likely to be found, thereby stressing the importance of grasping the dilemma roadmap. However, founders and scholars have discussed many potential solutions, and these should be assessed by platform startups from their own perspectives. In particular, the characteristics of an ideal solution that addresses all of the identified dilemmas were defined in Chapter 5.3.

6.1.5 Conceptual expansion

The extant platform literature focuses on exchange platforms and the interaction taking place in them; namely, buying and selling. However, based on this study, the exchange platform is only one case of online platforms. This study

expands the platform concept in online business environments, and proposes the following online-specific typology of platforms:

1) Exchange platforms (i.e., marketplaces)
2) Content platforms
3) Social platforms
4) Infrastructure.

These platforms differ through the type of interaction taking place in them. There are different implications to problems and solutions depending on the type of interaction. For example, economic and strategic solutions are likely to differ between marketplaces and content platforms as participants expect different services from the platform owners. Establishing an appropriate typology is important because utilizing motives for interaction as the distinguishing factor is likely to give a more detailed insight on how to solve platform-related dilemmas.

Another implication is that the types of complement differ from one type to another. In general, online platforms' complements include 1) *content*, 2) *users*, or 3) *applications*. Based on the type of platform, different complements are applicable. For example, content networks require content, whether produced in-house, by users, or aggregation; social platforms can build on a dual strategy of accumulating users and applications, which is because the social motive of frequenting these sites is compatible with the usage of various apps. In turn, exchange platforms require the users of the opposite side to generate interaction; thus, buyers require sellers and *vice versa*.

The strategies pertaining to each of these complements slightly differ; for example, a startup needs different strategies to increase content (e.g., syndication) as opposed to increasing users (e.g., inviting lead users) or trading partners (e.g., formally guaranteeing liquidity). Overall, the online platform typology and the ideal user generation (UG) model enable Internet-based specificities to be taken into account when considering platform strategies in the online business context.

Conceptually, this study expands the platform terminology by such concepts as:

- Cold start dilemma (as a variant of the chicken-and-egg problem)
- Lonely user dilemma (as a variant of the chicken-and-egg problem)
- Monetization dilemma (as a perspective to the dualistic nature of free offerings)
- Real-time problem (as a variant of the lonely user dilemma)
- Problems of active use and feature definition

- Strong/weak remora (referring to its bargaining power)
- Freefying (as a strategy to make online platforms free to use)
- Critical mass ratio (as a proxy measure for feasibility of the supply side to the demand side users)
- Supply to demand ratio (as a proxy measure for the balance of the two).

Through these concepts, this study takes the problems identified by founders to a higher abstraction level; thus, broadening the platform literature's perspective. One of the main uses of grounded theory is to generate novel and relevant concepts, and to share them with the research community (Glaser 1978). Thus, other authors are invited to employ and expand on these concepts. The author would like to commend grounded theory as a friendly method for conceptualization, seemingly resulting in novel concepts and ideas over the course of the research process.

6.1.6 Substantive theory: dilemmas of platform startups

The resulting grounded theory is a substantive one. It describes the cascading nature of the chicken-and-egg problem in the context of online platforms; in particular, how the problem divides into cold start and lonely user dilemmas, and how solving them through subsidization or platform integration leads to the monetization dilemma and remora's curse, respectively. In other words, while startups attempt to solve one problem, they soon face another. The situation is aggravated by the restrictions of time, or "runway" of a resource-limited startup firm.

An essential premise is that the platform might not always provide matches and liquidity, and therefore fails to solve the chicken-and-egg problem. The corollary is that the problem cannot be solved at once, and then continue onwards; rather, through the lonely user dilemma the problem of liquidity follows the platform for as long as it exists. Failing to identify and solve the problems in due time is likely to increase the chance of failure. Failing to identify their interconnections is likely to have the same effect, as does applying incorrect solutions. Therefore, understanding the nature of the dilemmas is quintessential for platform startups.

The "substantive theory of dilemmas of platform startups" is demonstrated in the following chain of arguments:

Argument 1: A startup needs to be financially viable in the long-term; that is, not to rely on investor-funding in perpetuity.

Argument 2: A platform startup faces many problems, including problems relating to its startup status, generic business problems, and problems pertaining to its business model (i.e., platform model).
Argument 3: These problems and their solutions are interrelated.
Argument 4: One of the most acute platform-related problems for startups is the chicken-and-egg problem, which requires the platform to provide matches at any point in time and place required by a user.
Argument 5: Startups often attempt to solve the chicken-and-egg problem by freefying and/or the remora model. However, because the problems and their solutions are interrelated, the following subarguments apply:

> **Subargument 1:** If a startup offers free access and usage of the platform, it cannot remain financially feasible in the long term, which is in conflict with Argument 1.
> **Subargument 2:** If a startup applies the remora model, it loses independence, which results in a poor bargaining position with a larger platform.
> **Subargument 3:** If the strategic interests of the larger platform and the startup collide, the larger platform as a strategic agent will act according to its own interests, which can have dire consequences for the startup's interests.
> **Subargument 4:** If the startup fails to identify and/or solve the strategic problems within a reasonable time, it is likely to fail.

Argument 6: Even when initially solving the chicken-and-egg problem (i.e., cold start), it potentially remains for as long as the platform exists (i.e., lonely user dilemma).

Given the aforementioned arguments and interrelations of startup dilemmas, it is possible to solve the chicken-and-egg problem through a solution which is either temporary (unstable) or permanent (stable), and satisfies the following requirements of a "perfect solution":

> **Requirement 1:** Self-sustainability vis-à-vis generation of complements.
> **Requirement 2:** Ubiquitous generation of matches at any time or place, and fulfilling other conditions needed by users.
> **Requirement 3:** Financially feasible user acquisition and service costs in addition to a plausible revenue-generation model to cover the aforementioned costs.
> **Requirement 4:** Independence over integrations that would endanger the platform owner's control over the platform's user groups.

This characterization of a perfect solution, given the framework of the study, can be regarded as a theoretical contribution. Disproving any part of the chain of arguments would require its reassessment. The generalizability of the findings is discussed in Subchapter 6.5.8.

6.2 Managerial implications

6.2.1 Think, plan, and utilize the roadmap

Regarding the outcomes, the author hopes that awareness of dilemmas aids entrepreneurs to identify, explicate, and specify them for treatment through strategic decisions and actions. In other words, the first step of solving a problem is to be aware of it, which is not always straightforward in complex circumstances. From a managerial perspective, the main lesson is to consider the possible problems and the consequences of their potential solutions, before they become roadblocks.

By acknowledging the potential emergence of the dilemmas, founders should be able to predict and prepare for them. As a short runway, or depletion of time and resources, is a startups' substantial enemy, knowing the potential hazards in advance can be highly useful, as this enables strategic planning and preparation. Although startups tend to change their business strategy quite often, planning with the benefit of more information should reduce the need for drastic changes, and thereby liberate resources for better execution.

In addition to being aware of the dilemmas, managers should note the proposed connections between them (see Figure 15, p. 195) and understand that a specific problem (e.g., cold start) does not exist in isolation, but is connected to other problems (e.g., monetization). Although further research could validate the precise sequence of dilemmas, and also discover new ones, those presented here provide a dilemma roadmap to founders struggling to succeed in the platform business.

In general, the study 1) demonstrates the dilemma roadmap for early-stage online platforms, and 2) advises them to think critically about conventional strategies such as freefying and integration with larger platforms.

In particular, a platform startup with a lack of funding that offers free access and usage will struggle to reach economic viability through indirect monetization. This is because competitors with funding will utilize it as a buffer until its free user base becomes profitable, assuming it ever will, and to acquire users by paid marketing, a luxury that the startup with no funding and no revenue, due to freefying, cannot afford. In a similar vein, while integration with a dominant platform provides a seemingly lucrative opportunity to solve

the chicken-and-egg problem, it simultaneously means that the startup is bound to the host in terms of customer relationship, monetization, and growth prospects. More advice is given in the following sections.

6.2.2 Avoid the free trap

In cases where direct monetization is deemed impossible with validated (i.e., without confirmation bias by the founders) beliefs, two alternatives are put forward: 1) either *move away* from that product category to something that can be monetized directly by offering a paid product, or 2) *opt for* an indirect monetization model other than advertising, and decide on this model before starting to build a user base, as subsequently changing the platform pricing becomes difficult due to change resistance from users and locked investments in product development. Many eminent bloggers discuss alternatives to indirect monetization (see e.g., Andrew Chen[252] and Lincoln Murphy[253]).

Even if access to a platform is given for free, to attract a user base and to match competition, consider building additional services that facilitate interaction between parties, and then monetize them. This might be a better solution than restricting features, access, or otherwise limiting the platform's ability. In fact, some platforms already apply this type of strategy by offering *human* services to facilitate interaction. In a sense, the approach is compatible with monetizing open-source software, which includes giving the technology away for free while charging clients for implementation and other consulting services (see e.g., Wasserman & West 2006). The analogy in consumer markets, however, remains to be discovered.

6.2.3 Beware of theoretical UG and network effects

The concept of network effects, if not properly understood and acted upon, is dangerous as it might be conveniently employed to fill gaps in a business plan. Moreover, theoretical network effects are a problem for practical decision-making. As, by definition, network effects do not exist prior to solving the chicken-and-egg problem, founders who rely on them are betting on the unknown. Theoretical network effects, when placed in a business plan, can distort the dynamics of the plan. Therefore, it is suggested that initial planning

252 http://andrewchen.co/
253 http://lincolnmurphy.com/

should take place without including strong network effects, but rather focus on providing a service to each side of the market individually.

Theoretical network effects are expected synergies of platforms' coordination to one or many parties as presumed by the founders. If the presumptions are correct, the network effects become only potential network effects. When they are realized, they become actual network effects that can be measured. This is demonstrated below:

Theoretical → potential → *actual* network effects

Theoretical network effects direct a startup founder to anticipate high growth. In turn, anticipation of high growth directs allocation of resources to the platform's technological performance; the tradeoff by focusing on product development is that founders neglect to validate end-user demand. This conclusion has also been made by the researchers of a project named Startup Genome, who term this effect *premature scaling* (Summary of Startup Genome Report Extra: Premature Scaling 2011).

If founders take network effects literally *a priori*, they risk making a fatal assumption. Before realization, all network effects are purely *theoretical*. Even after reaching actual network effects, there are other factors that might bypass them in adoption. For example, consider Facebook replacing MySpace from zero users within a year; clearly, a large user base does not prevent reverse tipping in the case of a superior platform. Theoretical, not actual, network effects can simultaneously coexist with a large user base. This seemingly paradoxical situation exists because network effects are a temporal phenomenon depending both on the number of connections in a network and their usage. Therefore, instead of the number of users, the frequency of interaction between them is a good predictor. The managerial implication relates to not overemphasizing the metrics showing user base growth but to those showing activity. The challenge for a startup, or any other platform, is to maintain engagement that, in this study, has been termed the problem of active use and relates to the lonely user dilemma (see Subchapter 4.5.1).

The analysis has shown the limitations of the platform strategy when applied by early-stage startups and, in particular, what the platform model is not applied; namely, a substitute for marketing and support functions. Some founders are vulnerable to erratic thinking that if they do not have the aptitude for content creation or marketing, users will somehow do it for them. In most cases the author has witnessed, this does not occur. Even if UG, which is often *implicitly* assumed, performed these functions, the expectations need to be *explicitly* made clear by the founders when planning their businesses. In a similar vein, founders should be prepared to undertake an equivalent amount

of work to kick-off UG effects as they put into product development. Expecting UG to self-propagate without considerable investments of time and effort is an unrealistic strategy. Moreover, as there is a mix of possible strategies in the continuum of pure platform and pure intermediary, startups might consider other models in addition to the pure platform.

6.2.4 Beware of the internalization problem

Finally, the author cautions to take these issues seriously. The founders in the sample were aware of the challenges and did not expect their startups to be easy. However, in hindsight, they recognized the lack of truly understanding challenges *a priori*. The author has observed a clear *internalization problem*, which implies a condition whereby advice is seemingly understood but neglected in practical strategy. It can be very difficult to apply others' learning to one's own startup.

Moreover, at times, the startup community, including previously successful founders, seems to give contradictory advice. As noted by a founder (Goldenson 2009):

> *"Plenty of useful advice conflicts […]: know your Customer versus build for yourself, don't raise too much versus don't raise too little. The better answer to these questions is 'it depends'. Advice isn't like code that's easily executed, but like map coordinates that require skill and context."*

The advice, therefore, might actually be logical and consistent; conflicting advices can be logical and, therefore, rational approaches. However, as explained in the quotation above, the application of advice is subject to context, although it can be given in a form of "empirical law". In other words, givers of advice have adopted different assumptions. As such, it is crucial to understand the underlying logic rather than the literal advice. Founders need to be cautious when receiving advice based on experiences in other contexts, while simultaneously remaining open to learning. Their judgment will develop through learning and failures.

The value of learning through failing is leveraged in the next project. Startups should therefore abandon the idea of a "one-shot game", and instead adopt the idea of a sequential game with much iteration, applying game-theoretic terms. In a sequential game, learning (i.e., adapting strategy) is often more important than the starting point. This, it is argued, applies well to the entrepreneurial lifecycle; logic which is illustrated in the following figure.

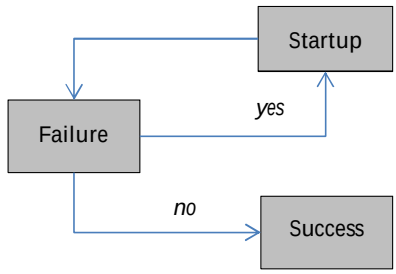

Figure 17 Logic of “keep on trying”

In fact, two-thirds of founders in the study’s sample subsequently started another company, which supports the idea of a “sequential game”.

6.2.5 Concluding advice

In brief, recommendations for managers of platform startups are summarized as follows:

1. *Avoid* the bias of reference points. Even if, for example, Facebook has done 'x', this does not imply that doing 'x' will work equally in your startup. Instead, consider critically if and how it will apply.
2. *Avoid* relying on theoretical network effects, which are not the only factor for adoption. Instead, build standalone value.
3. *Avoid* adopting the ideal UG model, unless you have a solid plan with which to create and leverage a community to work for you. Instead, build a company that can, at least initially, perform all of these tasks.
4. When planning for network effects, *ensure* side A is genuinely interested in the presence of side B to the extent that willingness to pay is achieved.
5. *Consider* charging for the product from day one, which will reveal whether or not a genuine demand exists. It is more difficult to move from free to paid than *vice versa*.
6. *Understand* that a ‘build it and they will come’ mentality will effectively lead to no one coming, as there can be no network effects without a network. Thus, build a credible marketing strategy for each side.

7. *Choose* whether you want to apply ‘go big or go home’ or ‘go niche’ strategies. Understand that the former will require considerable funding.

6.3 Marketing implications

As this is a dissertation in *marketing*, it is appropriate to consider the implications for marketers and marketing research.

Briefly, marketing can be regarded as applied economics in the sense that marketing aims to facilitate the fundamental purpose of markets: connecting supply and demand (Arndt 1978). Advertising is a method by which this can be achieved, but not the only one. Modern platform startups are fortunate for having the opportunity to apply a myriad of methods with which to solve cold start issues, although each of *them* has specificities that are considered elsewhere.

For example, conversion optimization, inbound marketing, search engine marketing, and viral marketing are methods applied by practitioners (i.e., digital marketing managers) to solve platform-related marketing challenges. *Platform marketing* has its own specificities that are described, for example, by Evans et al. (2006), and can include “evangelization”, which includes such activities as developer conferences, frequent communication, and incentives, as was the case for Apple, led by their then chief evangelist, Guy Kawasaki.

The issue is slightly complicated by the fact that state-of-the-art marketing techniques are not mainstream topics of interest in the marketing literature. This has led to a situation in which practitioners hold considerably more knowledge on how to tackle marketing problems in modern Web markets than researchers in general, and is also partly the reason why this study was positioned to the platform literature as opposed to the marketing literature. The digital marketing manager’s job, for example, comprises a great deal of the aforementioned tactics towards which mainstream marketing has been slow to gravitate. Nevertheless, there are signs of a gradual “waking up” to the digital world; for example, the *Journal of Marketing* has released several articles relating to online marketing. However, these seem more peripheral than an emergence of serious interest.

Nevertheless, many classic marketing concepts address principles that completely match the requirements of platform marketing. For example, Claude Hopkins (1968) referred to conversion 80 years before it became fashionable[254]. Many scientific advertising principles are being employed under the

[254] The first edition of Claude Hopkins’ hallmark book was published in 1923.

banner of conversion optimization, without their users having knowledge on Hopkins or his work. Without strong contemporaries and lacking historical knowledge on marketing, practitioners have re-created methods from scratch. Conversion optimization is one example; another is so-called customer development (see Chapter 5.3), which is essentially a new name for marketing research. It is noticeable that its inventor explicitly states that it is *not* marketing research (e.g., running focus groups) but a more useful method.

Based on the author's observations, marketing has a somewhat bad reputation among early-stage technology startups; they feel it is expensive, slow, and does not produce the desired results. This is why they are developing their own methods. Marketing has to blame itself for focusing on the large firm perspective and strict empirical work as opposed to theory development. It is difficult for practitioners to interpret results of, for example, the *Journal of Marketing*, and on many occasions there has been a gap between research results and their popularization. However, the purpose of marketing research should be to remain close to the field. Similar to economists, who perceive their task as providing insight to policy makers, marketing researchers should acknowledge their debt to marketing managers.

Marketing theory *does* have much to contribute to solving the dilemmas. The study's author has already considered several tactics such as *bait and switch*, sampling, and viral marketing. Future research could easily address ways for marketing to assist with solving platform-related dilemmas. More bridging is needed so that the great ideas of platform theorists, especially economists, do not remain unnoticed in marketing, and so that the creative solutions offered by marketing theory and practice become properly integrated into theoretical models.

6.4 Suggestions for further research

6.4.1 Comparison to success

Given that the dilemmas studied here emerged mainly from failed startups, further research should focus on systematic comparison of failure cases to success cases to isolate the best strategies for solving the startup dilemmas. The extent to which the problems and solutions experienced by successful and failed startups differ and overlap should be understood. The "requirement of symmetry" (i.e., comparing failures vs. successes) enables a more accurate understanding on startups' journeys.

6.4.2 More dilemmas

As noted in Chapter 4.3, the analysis showed more dilemmas than have been considered in the final version of this study. These included 1) pioneer's dilemma, 2) pivot dilemma, and 3) Peter Pan's dilemma. Briefly, the pioneer's dilemma addresses "when to launch?" questions; in effect, an early launch might result in the release of an imperfect product and therefore lack adoption, whereas delaying launch until the product is perfected leads to competitors getting a head start. The pivot dilemma addresses the question concerning "when to change course?"

Startups constantly receive external signals that they need to interpret; however, making a new change based on every feature request leads to "feature blow", whereas totally ignoring users' wishes is equally detrimental. The so-called "Peter Pan's dilemma" addresses the complex relationship between founders and venture capitalists; in effect, accepting venture funding gives startups the resource to manage competition while, at the same time, imposing a "go big or go home" scenario, in which a profitable niche is not a possibility. This and other dilemmas could be explored further in subsequent studies.

6.4.3 Strategic decision-making biases

Second, given the extremely high dependency of an early-stage startup on its founder, the founder's decision-making is crucial in a) detecting, b) understanding, and c) solving dilemmas. However, as noted by Tversky and Kahneman (1974, 237), "*in making predictions and judgments under uncertainty, people do not appear to follow the calculus of chance or the statistical theory of prediction*". Instead, they seem to rely on heuristics that can lead to systematic and severe errors, and thus founders do not necessarily approach dilemmas in a systematic way.

Therefore, it is a crucial step for further research to clarify founders' biases. While this is beyond the scope of this study, preliminary evidence reported by founders indicates the existence of hindering thought models that prevent some of the dilemmas from being identified and solved. For example, finding solutions to the cold start dilemma is hindered by the existence of the so-called 'build it and they will come' fallacy, which some founders reported had affected their decision-making, as shown by the exhibits in the following table.

Table 32 ‘Build it and they will come’

	Exhibit
[1]	*"As entrepreneurs and business owners, it’s not fun to think about failure. Actually failing is far, far worse. You release a fantastically craptastic product that you think everybody wants. Turns out nobody wants, or even understands it – not even your friends. Before you know it, the wheels have completely come off and you’re back to square (minus) one."* (The Chubby Team 2010).
[2]	*"[B]uilding a community is hard. We fell into the 'build it and they will come' school of thought, although even when they came, we still weren’t in good shape. Users didn’t review because there was no enlightened self-interest for them to do so. Nobody wanted to edit our data for the same reason. People submitted companies to our database mainly looking for a link."* (The Chubby Team 2010).
[3]	*"Combine [lack of design] with our 'build it and they will come' mentality, a typical engineers’ outlook, and the result was clearly not up to my personal or professional standards, and had very little marketing push to get it in front of our target customers."* (Smith 2008).
[4]	*"If you are bootstrapping, I’m not convinced that “build it they will come” is better than taking your limited resources to Vegas and playing the craps table for a few hours. Getting the attention of end-users is extremely hard and expensive; I think there is a great deal of luck in the 'viral marketing' stories you hear about startups that get huge from a garage."* (Smith 2008).

Examining this type of thought problem is beyond the scope of this study. However, it seems that some founders are inclined towards *reality distortion* [1], whereby product quality is judged better than it is perceived by users. The bias might be related to *community building* as a strategy, which is in line with the ideal UG model but requires proper incentives to function [2]. The bias might be harmful because it influences strategic decision-making to the extent that marketing is ignored. Instead, the founder believes the product will “sell itself” [3]. Further, the assumption might be re-enforced by positive stories from the press that highlight outlier cases of spectacular success [4]. In any case, the existence and nature of the bias merits further research. It is important to recognize that, in general, decision-making at *any level* is vulnerable to biases[255] as they influence assumptions, and assumptions influence decision-making. If the cold start problem, for example, is assumed away by biased thinking, its discovery causes delays and the startup loses valuable time.

Another example is the *illusion of free*, a proposed type of over-generalization that might be a harmful misconception among startup founders. To elaborate, if founders purposefully avoid creating business ideas that would require the end user to pay for the product, and given the reverse that there are at least some consumers willing to pay for the product, the conclusion of avoiding paid products leads to unnecessary limitations on imaginable business ideas. In other words, startups would rephrase “nobody is willing to pay”[256] with

[255] Note, for example, the classic description of *groupthink* (Janis 1982).

[256] *“Video producers are afraid of charging for content because they don’t think people will pay. And they’re largely right. Consumers still don’t like paying for stuff, period.”* (Diaz, 2010).

"most consumers are unwilling to pay, but maybe there will be sufficient consumers who will pay to warrant a viable business." Clearly, there are examples of online startups that have successfully sold their product or content[257]. If customers' unwillingness to pay for content or products online were categorically true, there would be no online businesses with direct monetization. This is clearly not true, as many such businesses can be found. Therefore, at most, unwillingness to pay can be defined as a tendency, not an immutable law.

The existence of illusions of free is crucial to founders' strategic decision-making. Assuming *a priori* a lack of willingness to pay (WTP) leads to negative effects, as mentioned in Chapter 4.6, constraints on perceived business opportunities are among such effects. Furthermore, a strong assumption can prevent experimentation with direct monetization that, if properly executed, given the potential for confirmation bias, might shed light on the specific case of the startup. Further, if no WTP was discovered through this experiment, the startup might be able to reconsider its position and potentially pivot to another field of business. Alternatively, as platform business models rely on extracting economic value from efficiency effects provided by the platform (Parker & Van Alstyne 2005), a startup might want to discover new revenue models, although there is a possibility that the efficiency gains will be extracted by users if fees are not introduced. This can be formulates as a hypothesis:

Hypothesis: startup founders are likely to underestimate their ability to monetize directly and overestimate their ability to monetize indirectly.

Testing this hypothesis is beyond the scope of this study, and will be put forward as an opportunity for further research. However, successful validation would highlight important implications for decision-making with regard to online business models. Moreover, there were other potential sources of biased thinking identified by founders, and further research might help to better understand perceived problems relating to dilemmas.

6.4.4 More solutions from practice

Solving the cold start dilemma in addition to other dilemmas is quite complicated. Future research might determine novel solutions not considered in this study. As a qualitative dimension emerges in match-making, increasing the likelihood of matches, that is, solving the chicken-and-egg problem, does not automatically follow an increase in the number of participants. This is a

[257] For example, Spotify, Dropbox, Netflix, Salesforce.com, and LinkedIn.

crucial observation that, if possible, platform theorists and managers should internalize in modeling and planning platform businesses. Targeting user groups granularly and understanding their intents and what types of counterparty they seek is quintessential for matches. Such an approach is context-dependent and requires customer insight. Through this linkage, marketing theory and practice have a lot to contribute to platform business, and their relationship should be explored in further studies.

In particular, researchers would benefit from close contact with practitioners who address tactical solutions in their everyday decision-making. Many creative solutions have been derived from the practical sphere; for example, the dual-sided referral incentive applied by Dropbox[258]. In addition, mashups (i.e., integrating content from several sources), content aggregation, and value envelopment are some potential topics for research. More research is also needed to understand platform diversification as a strategy for risk management. Fortunately, studies focusing on solutions are possible when there is an understanding on the nature of the problems and their interrelations, which is provided by this study.

When further studies on this problem space take place, applying GT as a method will enable the discovery of unexpected routes. Particular benefits include the use of all available data sources (i.e., "all is data", including e.g., online discussion forums and quantitative data), constant comparison, and theoretical sampling which enable a thorough understanding on the solutions and their relation to earlier findings. To effectively discover novel solutions, the author strongly advocates methodological pluralism. Deep immersion to the reality of startups is required; in particular, methods such as grounded theory, action research, and nethnography (i.e., the ethnography of computer mediated communication) enable both observation and participation in the "everyday life" of platform startups. Platform researchers should embrace methodological pluralism, and synthesize the rich findings from immersive, interpretative studies with analytical modeling.

6.4.5 Power dynamics

Fourth, research could focus on determining how collaborating platforms might form coalitions and synchronically grow their user bases. Any exchange of users is subject to power dynamics, as the more successful platforms are tempted to protect their success. Further research might therefore apply power-related frameworks (e.g., agency theory) to study platform relationships

[258] www.dropbox.com

in more detail. Introducing and employing quality to divide participation into low and high quality enables the bridging of theoretical treatment toward phenomena such as adverse selection, in which a market degrades due to the poor quality of one side, which leads to bad quality on the complementary side and, finally, the loss of high quality agents (cf. Akerlof 1970).

Such settings might enable platform theory to better understand why some recent demises have occurred, such as MySpace rapidly being displaced by Facebook; for example, *is it primarily feature differentiation or types of user that drive negative development?* It was concluded that successful business logics do not necessarily transfer to other contexts. Thus, research might clarify the conditions necessary for successful transference of business logic across contexts. In particular, this relates to the generalizability of network effects; in some cases they seem to generalize while, in others, niches remain isolated.

6.4.6 Synthesis of marketing and platform theories

Fifth, creative marketing strategies have a lot of potential to solve cold start problems. The related literature includes, for example, viral marketing theory, trust, and motivation of users and crowds. In particular, a large body of the viral marketing literature discusses how to find and engage the most influential users. A platform that is able turn its most connected users to ambassadors can quickly gain competitive advantage with relatively little effort. This might involve advanced seeding strategies and niche experience, which many startups do not possess.

In particular, if the paid user base is sufficiently significant to sustain free users and satisfy the startup's financial goals, the freemium solution might be successful. Nevertheless, research might increase understanding on the conditions under which users convert to paid customers. This relates to emerging studies on conversion optimization (see e.g., Paden 2011; Jankowski 2013; Soonsawad 2013). Equally important will be research on additional indirect monetization beyond advertising, which is deemed difficult. Innovative approaches are needed to monetize a user base under hyper-competition.

Future research might also discover how startups can leverage inbound marketing to reap UG benefits. This interesting marketing philosophy might be particularly suitable for startups as it offers an alternative to mass-market advertising. However, at the same time, it requires specific skills on content production. Further research might bridge the cold start problem to these literature streams, and therefore provide new insight for the platform literature on adopting platforms under uncertainty.

6.4.7 Literature integration

Sixth, not only marketing, but also other disciplines have potential to contribute to the platform theory. Further theoretical treatment of the dilemma would lead researchers to various streams across disciplines that cannot be covered in this study in its current scope. To give a preliminary chart for further exploration, a list of potentially relevant streams of the literature is offered below.

1. *Diffusion of innovations*: How does diffusion of platforms take place?
2. *Technology acceptance models*: Why are technological platforms adopted? What are the barriers to their adoption?
3. *Theory of viral marketing*: How can a firm influence the self-propagation of platforms?
4. *Social network theory*: How can the most influential "nodes" for platform adoption be identified?

Essentially, the abovementioned streams refer to some topics relating to adoption of technology. For example, there are barriers of platform adoption that need to be addressed. One interviewed startup's founder mentioned that its prospects are afraid of committing before they are certain that the platform will fulfill its purpose. This is clearly related to the chicken-and-egg problem, in the sense that the startup needs to provide and signal legitimacy to its potential users on either side, or else they are wary of the expected gains. The decision-makers in the target organization might also behave strategically; according to one interviewed founder, they are more reluctant to adopt a platform if it increases their own workload.

This study has purposefully focused on platform theory that, arguably, has limited coverage in the literature relating to adoption of innovation/technology and the associated barriers. For example, confusion seems to arise concerning the notion on whether or when the size of the user base is a sufficient proxy for network effects. In particular, research focuses on platforms when they have *already* reached the point of critical mass, so that user propagation works *because it works*. However, this is not particularly useful for firms interested in the question of *how* to reach that point. Especially, in early dynamics of the platform, when the quantity is not available, size is not the only relevant proxy for explaining the concept of self-propagating platforms. Therefore, further research needs to bridge the concept of adoption to state-of-the-art research in other fields in which it is discussed.

6.4.8 Introducing other contexts

Seventh, by introducing new contexts, the scope and explanatory power of the substantive theory could be greatly expanded. Moreover, the study could seek to generalize by comparing different contexts beyond the online context. Collingridge and Gantt (2008) suggest a proximal similarity model in which generalizability between two contexts depends on the match of their similarity. It would be interesting to determine how contextual changes influence the emergence of, for instance, the chicken-and-egg problem. This study has shown its manifestations in the online context, but it is possible that other contexts might introduce new types of manifestation.

Finally, future research can be targeted to solidify some of the assumptions made in this study. This study can be applied as a theoretical basis for measuring creation, operationalization, and the forming of hypotheses that can be tested in deductive, experimental, or other research settings; for example, considering the proposed founder biases or UG. This study cannot prove that firms systematically engage in behaviors that would delegate their critical functions according to the UG model, which is why the model is defined as ideal. However, startups, which tend to apply state-of-the-art survival strategies, indicate that this type of development might be possible. If so, firms of all sizes might benefit from extending their resources through online platforms.

6.5 Credibility

6.5.1 Evaluative criteria

Instead of validity, credibility has been proposed as the criterion for determining the trustworthiness of qualitative research (Miles & Huberman 1994). Lincoln and Guba (1985) advocate “naturalistic inquiry”, and suggest replacing internal validity with credibility to evaluate such research.

Various criteria for evaluating GT research have been proposed. Traditional validity and reliability have been regarded as incompatible with qualitative research (Seale 1999). Glaser (1978) proposes four criteria to evaluate GT studies: 1) fit, 2) workability, 3) relevance, and 4) modifiability. Corbin and Strauss (1990) discuss 14 criteria relating to the research process and findings’ empirical grounding. Kempster and Parry (2011) apply a critical realist perspective to propose practical adequacy and plausibility as alternative criteria to the positivistic criterion of internal validity. These criteria will be examined next.

Lincoln and Guba (1985) suggest reformulating the criteria for assessing the trustworthiness of qualitative research as follows:

Internal validity → credibility
External validity → transferability
Reliability → dependability
Objectivity → confirmability

Credibility implies that, in the absence of exact numerical measures to determine validity, a theory's credibility is based on its believability by the subjects under investigation (Wagner et al. 2010). *Transferability* is not inferring from a sample to a population, but rather considering in which contexts the results might apply; the greater the transferability, the more general the theory (*ibid.*). Gasson (2003) points out that transferability evaluates how results can be employed to shape other useful theories.

Furthermore, whereas reliability is generally regarded as an estimate of the research tool's consistency (i.e., how stable are its results?), *dependability* aims to capture the researcher's impact, not only his/her interpretation but also the research process, which should be stable across time and researchers (Gasson 2003). Thus, it assesses the study's replicability (Wagner et al. 2010). Finally, *confirmability* implies that conclusions should be based on the subjects and conditions of the study, instead of the researcher (Gasson 2003).

Wagner et al. (2010) suggest that Lincoln and Guba's (1985) criteria seem appropriate for evaluating GT. In particular, they note that "*[c]redibility has high status within GT [grounded theory]. It is Glaser/Strauss's explicit concern to generate theories that are credible, understandable and relevant to the participants in the research.*" (Wagner et al. 2010, 8).

Glaser's (1978) criteria requires good GT to fit the real world, work across different contexts, is relevant for the individuals applying it, and can be modified into further theory generation. These bear some similarity to Lincoln and Guba's (1985) later criteria; in particular, regarding the use of theory in other similar and non-similar contexts, and the connection to practitioners of that theory.

6.5.2 Evaluation of credibility

Table 33 captures an evaluation of this study by employing the aforementioned criteria proposed by Glaser (1978), and Lincoln and Guba (1985). Another evaluation of the study with criteria by Corbin and Strauss (1990) can be found in Appendix 4.

Table 33 Evaluation of credibility

Criterion	Evaluation
Fit	Constant comparison and GT coding procedures have been followed.
Workability	Workability of the conclusions are grounded in the material but need to be put into practice.
Relevance	Data originates from startup founders; theoretical sampling and industry familiarization suggest relevance.
Modifiability	Potential ways of expansion are shown, for example, to biases and other dilemmas.
Credibility	The author has familiarized himself with startups and platform theory; theoretical saturation can be implied.
Transferability	Results are unlikely to be transferred to other platform types without modification.
Dependability	Researcher's influence shows in selection of core category (i.e., the focus of analysis)
Confirmability	Coding guide is provided; data is public; confirmation waits for other studies.

First, as described in Chapter 2.4, the GT method has been followed. This involved employing constant comparison and theoretical sampling, which are perceived to improve the quality of the results (Corbin & Strauss 1990, 421): "*Making comparisons assists the researcher to guard against bias (you are constantly challenging what you think against the data).*" Glaser and Strauss (1965) regard constant comparison as a means of improving credibility; the results are credible because they are compared across groups and slices of data, thereby embodying a built-in system of verification. If the researcher is following theoretical sampling, and thus is driven by emerging theory to collect additional data until saturation is reached, and if these data are integrated by adjusting the properties of the emerging theory, the results should fulfill the criteria of good theory (Glaser 1971).

Second, workability needs to be determined in practice, which has been the sincere intention of the researcher in various online platform contexts. Grounded theory should aim for results that work (Glaser & Strauss 1967). This pragmatist (Kempster & Parry 2011) approach highlights a research's purpose. The purpose of this research is to provide useful results for scholars and practitioners involved in the platform business. However, this part is hard to evaluate. For example, consider an engineer devising a model of an invention: he/she can test his/her ideas in practice and it quickly becomes clear whether or not the design works. For this analogy to work, the results of this

study should be *applied* and, given that they do not outline a procedure that can be falsified in practice, they should be applied to develop strategic platform thinking. Through internalization and understanding platform specificities, the lessons of this study can be applied, tested, and modified. Although the researcher has confidence in his conclusions, their credibility is bounded in their use (Martin & Turner 1986).

Third, the informants are experts in their field. Lyon, Lumpkin, and Dess (2000) assign the following advantages to single-source sampling in qualitative studies: 1) it is likely that the most knowledgeable individual in the company will provide the information, 2) in a small company, the respondent's perceptions might reflect those of the firm, and 3) focusing on one informant enables access to many cases because one will not drain all data collection resources. Packham (2002, 171) notes that "*[t]he small firm, to all intents and purposes, is an extension of its founder or owner-management team [therefore] any analysis of venture growth cannot preclude the entrepreneur*." This highlights the strengths of analyzing data originating from the founder who is knowledgeable on the particular (i.e., small) organization.

A similar conclusion is also made by Lyon et al. (2000, 1058) who assert that "*[e]ntrepreneurship researchers frequently use the self-reported perceptions of business owners and entrepreneurial executives because those individuals are typically quite knowledgeable regarding company strategies and business circumstances.*" Therefore, it is not uncommon in business studies focused on startups to collect data from one informant, and it might even be regarded as beneficial. Although there might be hidden information that reduces the trustworthiness of individual stories, the patterns of strategic challenges emerging from several cases can be perceived to increase credibility (Eisenhardt 1989).

Additionally, relevance can be seen to emerge from theoretical sampling and familiarization with the industry. These efforts took place via reading on startups and discussions with founders (see Chapter 2.4). The idea was to improve the researcher's judgment by talking to founders outside the sample. As the familiarization period of participation was quite long (i.e., 2010-2013) and the number of founders with whom the researcher conversed (>50) was larger than the original sample, it was possible to gather useful industry insight that enhanced the findings.

The discussions with founders outside the sample extended over a period of more than three years, and involved active participation in startup events in Finland, Sweden, and the United States. During these events, the researcher conversed with founders and aimed to develop his strategic thinking, and also an understanding on the circumstances and rationale of startup decision-making.

Fourth, comparison with the extant literature helps to confirm findings of inductive studies (Miles & Huberman 1994). According to Eisenhardt (1989, 544), based on potential conflicts "*readers may assume that the results are incorrect (a challenge to internal validity), or if correct, are idiosyncratic to the specific cases of the study (a challenge to generalizability)*." There were no major conflicts with the constructs arising from the platform literature; in fact, the strategic dilemmas elicited from post-mortems can be connected rather easily to the platform literature. It was found that the literature confirmed and deepened the analysis by presenting several strategic solutions. In contrast, the empirical analysis sheds light on the dilemmas' relationships in the context of online platforms. The two approaches complement one another.

Fifth, the stories are public and can be accessed by anyone. Other research might confirm or refute the conclusions made in this study, and "*readers may apply their own standards*" (Eisenhardt 1989, 544). Hidden information can be regarded as a major obstacle in assessing the credibility of research (Sommer & Sommer 1992). Therefore, public data are an advantage for evaluating the credibility of this study. General principles of scientific inquiries include replication (Easley, Madden, & Dunn 2000). For this purpose, and to demonstrate the logic applied in the analysis, we have provided a coding paradigm that lists the codes and their meaning. Thus, another researcher can internalize the coding structure and repeat the study in question. The coding guide can be found in Appendix 1.

6.5.3 Success with theory

As the study's purpose is to create a substantive theory, the evaluation of GT should also consider the extent to which this attempt is successful. Kempster and Parry (2011) note that a constant concern in GT research has been the inability to raise the abstraction level, while remaining "stuck" in description. Although it cannot be stated that strategic problems as a core category explain all similarities and variation (Kan & Parry 2004), the author maintains that, according to his interpretations, these problems represent a remarkable pattern in the data and, combined with the insight of the platform literature, arguably influence the success or failure of any given platform startup that is compatible with the online-specific typology presented in Chapter 3.

According to Charmaz (1990, 1164), "*a theory explicates a phenomena, specifies concepts which categorize the relevant phenomena, explains relationships between concepts and provides a framework for making predictions*." Making exact predictions through our framework requires skill. However, the purpose is indeed to provide such characterization, or a dilemma

roadmap. The extent to which founders are able to understand the results of this study is difficult to know. However, in verbal discussions with them, identifying these specific dilemmas has intuitively resonated with the 50-or-so founders with whom the author has conversed.

According to Wagner et al. (2010), an "adequate use" of GT would identify which approach (i.e., Glaserian or Straussian) the researcher has followed, mention the specific GT techniques employed, and generate real theory as opposed to case descriptions. This study was positioned in the internal GT debate (see Chapter 2.4), explicated its use of GT techniques (Chapter 2.4), and aimed to transcend description by conceptualizing "lasting" dilemmas. However, as a substantive theory, the theory presented here is limited in analytical generalizability. It depends on the reader to determine its usefulness. Arguably, the study offers more insight for scholars and practitioners familiar with the strategic problems than for others. This is simply the nature of substantive theory, the credibility of which is a "joint venture" of the researcher and the reader (Glaser & Strauss 1965).

According to Strauss and Corbin (1994), a theory is "ready" when there are no more novel possibilities; that is, a point of theoretical saturation has been reached. Theoretical saturation occurs when there are no new variations in terms of codes and their explanation is relevant to the central construct, and when the imaginable settings and configurations relating to the theory, emerging from and applied to the data at hand, have been exhausted. A corollary to this method is, however, that GT is never truly ready as, by constant comparison, it can always be expanded (Glaser 1978). Grounded theory gives a representation of reality, but this representation is not meant to be decisive as reality and contexts keep changing[259].

6.5.4 Saturation

Theoretical saturation can be deemed a criterion for GT studies, although its existence or absence is difficult to verify (Gasson 2003). Accordingly, data collection (i.e., theoretical sampling) must continue until saturation. Strauss and Corbin (1994) refer to this as "category saturation", implying that the core category and its subcategories need to be exhaustively covered. Simultaneously, theoretical sampling is a technique of verification applied by the researcher (Suddaby 2006). Saturation emerges when there are no more

[259] Theory is never absolute because it can never be completely proven; it can falsified (i.e., refuted) or verified to some extent (Hunt 2002). However, a theory has an indirect relationship to facts that, in turn, have an indirect relationship to what is termed reality (Meyling 1997).

surprises that challenge the emerging coding system (Finch 2002). Suddaby (2006, 639) states that saturation is signaled by "*repetition of information and confirmation of existing conceptual categories*", which he notes depends not only on the empirical context but also on the researcher's experience and expertise; in grounded theory terms, theoretical sensitivity (Glaser 1978).

Reaching saturation in this study was signaled by three indices. First, the researcher found patterns; several instances of each dilemma were found across different post-mortems, and thus the data were perceived to be sufficient (refer to exhibits in Chapter 4). Second, discussion with founders beyond the sample yielded no significant new insight that would have challenged or increased understanding beyond the initial findings. Third, familiarization with industry circumstances supported the existence of the dilemmas but did not yield additional, platform-specific dilemmas, which was a criterion in the theoretical integration phase. Although the author evaluates that the findings relating to the dilemmas are saturated, he does not make the same claim for the solutions which require more research to be comprehensive. In fact, it seems that more strategies and tactics to solve the issues emerge constantly; therefore, it is arguable whether a definitely comprehensive description of them is even possible. Moreover, theory-wise, the biases should be integrated to the dilemmas, as they seem to increase explanatory power concerning why the founders were unable to solve the dilemmas. In this sense, the theoretical claims made in this study do not establish a saturated whole, or a "ready" theory, that cannot be expanded by further studies. Thus, further studies are required for the above-mentioned purposes.

A part of the reason for employing multiple criteria to assess research quality stems from different scientific paradigms and philosophical stances (Kuhn 1970). This study represents a *critical realist* approach, thereby assuming that the analyzed material reflects reality (Kempster & Parry 2011). While it has been argued that classic GT follows a positivist agenda in "discovering" theory (Gasson 2003), Glaser in his later works (see e.g., Glaser 2004 & 2008) seems to belittle the risk of researcher's bias in finding this theory[260]. In this study, it has been deemed important to recognize the fallibility of the human condition. After all, a *systematic* distortion in either the data or their interpretation would lead to unhelpful conclusions and be contrary to the purpose of GT, as embedded in Glaser's (1971) criterion of "theory that works".

[260] Glaser's logic is twofold: if an informant's account is biased, either the bias becomes a social process to examine (e.g., impression management) or it is irrelevant because it nevertheless influences the informant's actions. However, Glaser fails to explain how the researcher concludes whether a piece of data is biased or not, and how this influences GT's ability to account for mechanisms of reality.

For example, consider the existence of a *systematic bias* in the post-mortem stories. While a relativist might include this as an interpretation of the world and accept it at face value, it is assumed in this study that a systematic bias would destroy the applicability of the results. If all interpretations are false, then correcting for the problems will not work because the problems were defined correctly in the first instance; that is, the proposed mechanism is not faulty. In other words, there would be some other unidentified mechanism(s) that account for the actualization of real strategic dilemmas.

Therefore, potential biases need to be considered; not only those arising from the data but also the researcher, given that the analysis of this study is in fact an interpretation of interpretations of reality. Wagner et al. (2010) observe that some researchers have employed Glaser and Strauss' (1967) unwillingness to address biases as an excuse for their own ignorance, but contend that excluding discussion on biases is not the correct way to approach credibility. It is important to acknowledge that interpretation is inherent in GT, although this does not reduce the credibility of its results. Interpretations influence and shape reality, and therefore understanding them might lead to results that can be applied to action or employed to predict actions of others. As Glaser and Strauss (1965, 9) state: "*Not infrequently people successfully stake their money, reputations and even lives as well as the fate of others upon their interpretations.*" There is potentially an unlimited number of biases in any type of research with human respondents (Tourangeau 1984). The author has tried to identify the major ones relating to this study, which will be discussed next in terms of risks relating to data, method, and the researcher.

6.5.5 Risks relating to data

6.5.5.1 Ulterior motives

The "truthfulness" of data is linked in many ways to the motives for expounding them. Table 34 illustrates founders' reasons for sharing their stories.

Table 34 Reasons for writing post-mortems

Explicit reasons for story	**Example**
Reflection of what happened / Avoidance of repeating mistakes	*"The purpose of this postmortem is to thoroughly reflect on what went wrong, so I, and perhaps others, will not make the same mistakes again."* (Nowak 2010).
Inspiring other founders, practical usefulness for other startups	*"A year from now this story will either be a testament to our methodology or an embarrassing reminder of all the mistakes we made. Either way, the hope is that it avoids the polish of hindsight and will be not only inspirational, but methodically practical to someone considering quitting their job."* (Lance & Snider 2006).
Therapeutic purpose, addresses emotions relating to failure	*"In the last five years, writing about my failures has been the best possible therapy […] I could have managed for myself."* (Feld 2006).
Introspection, making sense of the failure experience	*"This post-mortem will serve to get things off my chest, organize my thoughts, get the most out of the experience, and share my experience with others."* (Diaz 2010).
Responding to questions and third-party interpretations	*"I'm […] writing this to be able to point to a single, detailed, lengthy answer to the inevitable questions I'll be getting from friends and colleagues about what happened with [my startup]. Now people can read to their heart's content."* (Diaz 2010).

Stories are generally told for specific audiences. In the case of startup post-mortems, founders tend to address the stories to other founders (see Table 34). In this sense, we can refer to knowledge transfer; founders are interested in helping others to avoid repeating their mistakes. Indeed, one of the most frequent explicit motives to write a post-mortem is to help other founders avoid common mistakes. The second motive is psychological, and might serve a therapeutic purpose: by telling their stories, founders are able to reflect on failure, a stressful experience with which to come to terms. Reflecting on past failures was also perceived as learning for future startup projects; some founders might encourage potential founders to create a startup.

In addition to reported reasons, there might be implicit reasons for storytelling. This study can only speculate on the founders' true motives, which remain hidden. For example, a founder might engage in strategic behavior through storytelling, which can hinder the story's trustworthiness. Social effects can also take place, as noted by a practitioner: "*it's in nobody's best interest to call attention to their own bad decisions, and it's even less wise to poke fun at the bad decisions of your co-workers, who may be a vital part of the personal network that will keep you alive after the startup explodes.*" Therefore, founders might "soften" their own part in failures by omitting some information. Moreover, the story can be written in such a way that is intended to maintain a professional profile, for example, to impress investors or future employers (Bansal & Clelland 2004).

These points are not necessarily detrimental to the credibility of a story; secondary motives can underlie narratives, and are only problematic if the story in question is distorted. For example, the ulterior motive of 'appearing experienced' does not make the story less credible if the facts and interpretations within it are otherwise objective. In other words, the person making a claim is to be separated from the claim (cf. *argumentum ad hominem*).

6.5.5.2 Self-serving bias

Several authors have recognized the risk of self-serving bias in entrepreneurial studies. The self-serving motives risk distorting the trustworthiness of a story by omitting personal mistakes and assigning the blame to external as opposed to internal reasons. For example, Lussier (1996) found in his study that only five percent of the entrepreneurs surveyed identified poor management as a failure factor; thereby implying a tendency to blame external factors. Beaver and Jennings (2005) advise against employing surveys to find truthful accounts for failure as people are more likely to give self-serving responses and less likely to admit personal fault. Following the attribution theory, Zacharakis (1999) argues that individuals are more likely to attribute their own failures to external causes (e.g., recession), and failures of others to internal causes (e.g., poor management skills).

In contrast to Lussier's (1996) findings, Mantere, Aula, Schildt, and Vaara (2013) found that entrepreneurs in their case companies were ready to accept blame, and attributed less of it to their subordinates than that attributed by subordinates to the entrepreneurs, indicating a low self-serving bias. However, they stress that cognitive and emotional processing relating to the failure experience influence failure narratives; namely, grief recovery and self-justification (Mantere et al. 2013). There is little that can be done to control such effects. Nevertheless, a proxy measure of self-attribution is employed in this study. The measure is constructed so that if a founder in his/her post-mortem explicitly attributes failure, at least in part, to his own actions, this is considered self-attribution.

Exhibits based on this analysis are presented in the following table.

Table 35 Examples of self-attribution

	Exhibit
[1]	*"I'd also like to thank our venture-capital investors […] who took a big risk on an unproven concept and then took a large financial loss when we were unable to successfully execute on that concept."* (Potts 2007).
[2]	*"I have a tremendous amount of respect towards everyone that I've worked with on this endeavor and do not wish to even hint at a "should've"/"would've" discussion. What's done is done. There is no way to go back. And ultimately it failed under my watch, and that is mine to bear."* (Yaghmour 2010).
[3]	*"As co-founder and CEO of [the startup], the buck stops with me and no one else."* (Rafer 2009).
[4]	*"For one, we stuck with the wrong strategy for too long. I think this was partly because it was hard to admit the idea wasn't as good as I originally thought or that we couldn't make it work. If we had been honest with ourselves earlier on we may have been able to pivot sooner and have enough capital left to properly execute the new strategy. I believe the biggest mistake I made as CEO of [the startup] was failing to pivot sooner."* (Nowak 2010).
[5]	*"A final point that should be made is that this is not an attempt to blame anyone. The journalists aren't to blame: we didn't make a sufficiently good product for them. The developer isn't to blame; we tried to hire someone for a startup role who had no interest in startups. No, the only people to blame is us, and more specifically me, since I was at the helm when it all went down."* (Biggar 2010).
[6]	*"When [my co-founder] had to leave the company due to a family illness, I took over as CEO and led the company without a formal peer for the final two years. All that adds up to me having absolutely no one to blame for [the startup's] failure but myself, and as a result I can't now nor could ever be dispassionate in thinking about what happened."* (Hedlund 2010).

Self-attribution refers to a founder explicitly attributing failure to self; that is, taking responsibility rather than blaming external conditions. To be coded, the founder had to explicitly indicate his/her or the team's shortcoming in explaining the failure. There is a variation in interpretation as some founders sought to attribute reasons to external factors more than others. Self-attribution was coded in the material, and 41% of cases included references to self-attribution. Note that this does not indicate that the founder was not attributing blame to self, only whether or not it was explicitly stated in the post-mortem.

Therefore, it is concluded that, in general, the risk of self-justification considerably altering the stories is negligible. It is important to note that post-mortems have been made public on the Internet; thus, an intentional "twisting of facts" would risk the founders losing face and credibility (Krumpal 2011). Founders are likely to be aware of this and increase their level of candor. The final interpretation is thus in line with Mantere et al. (2003). As such, founders in our sample can generally be regarded as candid in their accounts.

6.5.5.3 Recall bias

Apart from apparent candidness, there are other types of bias that relate to recollection and interpretation. Elliot (2005) describes recall bias as forgetting past events or details in them, leading to deterioration of the data quality.[261]

In this study, recall bias, or forgetting important points, might be less relevant because the bias concerns details, not a *gestalt* (i.e., an organized whole that is perceived as more than the sum of its parts) of problems experienced (see Maitlis 2005). It is not likely that the gestalt (i.e., the whole story) would have been falsely remembered. It is more a problem of interpretation than memory if a specific dilemma was incorrect.

In the case of this study, all narratives were written within a year of failure. Although this does not remove the risk of recall bias, the longer the delay in reporting the event, the greater the likelihood of confusion (Coughlin 1990). A year might be regarded as too short a period to forget critical details, although sufficient for distancing one from the immediacy of failure, or grief recovery (Shepherd & Kuratko 2009). This might, in fact, improve the quality of post-mortems as the founders have had time to reflect, and are perhaps better able to place their story into a "bigger picture".

6.5.5.4 Unintentional false attribution

Moreover, *false attribution* can be a consequence of sense-making even without being self-serving or memory-distorted (Mantere et al. 2013). This is when a founder is unable to find the correct reasons, interprets facts incorrectly, or there is simply no prominent explanation other than the failure was a combination of many events, some unforeseen and random. In other words, it is a type of sense-making bias.

The fact that reports were voluntary (i.e., unpaid, not commanded) supports this perspective as, clearly, founders wanted to share some experiences they genuinely believed were of interest to others. If interpretations are internally consistent, there is no reason why "amateur theories" should be perceived as meaningless before closer examination. In fact, economics has also suffered from time to time with regard to questioning inaccurate rationality assumptions (Kanazawa 1998; Nagel 1963).

However, the sense-making style *does* differ among founders. For instance, the founder of a location-based startup was highly capable in conceptualizing specific problems, which indicates good analytical skills, whereas other

[261] In psychology, this is defined as *systematic* error in reproducing past events (Coughlin 1990).

founders were less capable of doing so or this capability was not visible in their stories. Inherently, this results in some incommensurability of data. This is why superficial stories were omitted from the sample; their analysis was not sufficiently rich to provide grounds for proper theorization. In our case, the hindsight perspective is useful as it enables reflection by founders. This property was particularly useful in the post-hoc analysis, when the data were re-analyzed for "what if" thoughts and proposals for solutions. After experiencing failure, founders tend to be more aware of the errors committed during the startup phase, whereas insights might be more anecdotal if the founders were interviewed during the experience (Schoenberger 1991). When founders share their *a posteriori* insights, they become a rich and valuable research material.

6.5.5.5 Communality

Another risk might be communality between the stories, so that they are not independent in interpreting the chain of events. More precisely, if the stories were written after first reading other stories, these other stories might have influenced how the founders explained their own failures, potentially leading to a systematic bias in interpretation. It is very difficult to account for such a bias, as this would necessitate determining whether or not founders read each other's stories. There are indications of this behavior occurring; for example, one founder wrote (Diaz 2010):

> *"There are many post-mortems from failed startups out there, mainly because there are a lot of failed startups, and the people that start them tend to be very introspective and public about their successes and failures. I'm no different."*

For example, data can be biased by the influence of other post-mortem stories or thought-leaders, so that founders identify challenges selectively, based on what others have previously noted. As a consequence, they might miss some points that they otherwise would have noticed. If peer influence is a source of sharing motivation, the risk is that stories become contaminated by other stories, so that interpretation follows earlier interpretation. Undoubtedly, some communality or patterns in the data relate to this bias. For example, founders employ vocabulary such as "iteration", "pivots", and "minimum viable product" to refer to their failures. Some of these terms originate from famous startup thinkers who have their own approaches to failure. Thus, the thinking of experts might have influenced the founders' interpretations. However, if founders perceive these expert explanations as accurate, they should be

treated with a degree of plausibility insofar as many of the experts are also entrepreneurs[262]. Moreover, the vocabulary utilized by Internet standards has evolved as a combination of, for example, many startups, experts, and investors. The collective "slang" therefore cannot be regarded as a bias, but a way of communicating within a community (Mazrui 1995).

However, communality is only a problem if an interpretation would otherwise have been different because, due to a desire to adhere to other stories, the founder has changed his/her interpretation. A positive sign of the lack of this bias is included in Appendix 3, which represents support for two opposing perspectives on whether or not to launch early. If the founders were subject to conformity bias, conflicting perspectives would be less likely to arise. Based on a strong dichotomy regarding early launch, and dissimilarities of details presented in the dilemma exhibits, a systematic *conformity bias* (Moscovici & Faucheux 1972) is not perceived to be a major issue.

6.5.5.6 Anchoring bias

Anchoring bias can take place if founders are overly focused on one aspect of the story. When anchoring, individuals focus on one value, or piece of information, over other values or information (Bunn 1975). According to Elliott (2005), the narrative story format is prone to simplifications; that is, emphasizing particular information over other information. For startups this might include overemphasizing one aspect of failure, while neglecting others. When these other aspects are judged critical by some objective measure, the resulting account would be distorted.

In other words, founders might highlight one specific point as the overarching explanation for the failure, while ignoring other aspects. For example, they might not have a perfect understanding on the platform model, and therefore might not properly interpret the dynamics leading to failure. However, at the same time, their interpretation might be more valuable as they are not "contaminated" by platform theory, and utilize their own terminology and experience to explicate critical aspects. Furthermore, founders are very knowledgeable on their cases; thus, even if they highlight particular aspects, they are more likely to have a more comprehensive picture than outsiders.

In assessing the seriousness of this bias, one has to acknowledge that employing GT, or conducting any research, requires simplification of the surrounding world's complexities. In this case, the stories generally included

[262] For example, Paul Graham, Eric Ries, and Steven Blank are thought-leaders whose terminology is widely applied by startup founders in their post-mortems.

not only one overarching explanation for failure but several of them, thereby reducing the impression of a strong anchoring bias.

6.5.5.7 Different interpretations

Founders, customers, investors, and other stakeholder groups can have different opinions on what actually happened. However, this study is only based on founders' interpretations. Table 36 presents some examples of interpretations, collected from comments on post-mortem stories, which differ from those found in the post-mortems.

Table 36 Examples of different interpretations

Source	Interpretation
Comments in Bragiel (2008)	*"I checked [the startup] twice […], when they launched and again in a year. There were zero improvements in that year! Still their blog was filled with crap like 'look at our brand new and cool office'. I posted a comment asking what's up and reporting some bugs. The comment was quickly deleted and nobody ever got back to me. That day I knew they were dead."*
	"I was probably what you would call an early Chicago adopter of [the startup], and I thought it was a great idea, and still do. With each succeeding version of the software, however, the interface seemed to get weirder and weirder until I couldn't figure it out anymore."
Comments in Goldenson (2009)	*"As it pertains to critical mass, we (if you remember, The Legion Team) always found it very frustrating that there were only a certain number of slots available for each team. In my opinion, it was this limitation that created the bottleneck. "*
	"Of course, scalability becomes an issue; but it's a critical one to place at the top of the priority list. Each week the 'ringleader' would have to go back and decide who was getting invites that day, and it ultimately limited participation. Why? Because we were all already part of the same community. We were all already on the same team. We wanted to play with each other, not against each other. It was us against the world, albeit if only 20 at a time. "
	"But with the inability for all of us to come back night after night, interest waned, and the lure of the Internet equivalent of A.D.D. [attention deficit disorder] took hold. ('Oh, look! A chicken!')"
	"Your words here are nothing short of courageous, and I have the utmost respect for them. This was just meant to shed some insight from a user perspective on why it was hard for us to grow as a […] community."
	"The way this guy characterizes this is grossly misleading. [The startup] was a great idea, but extremely poorly executed. They spent $600/$900k of investors' money. [...] The quality of their video was easily eclipsed by an $800 trip to best buy as far as technology goes. They'd often have laziness issues on cam, where the host would just plain forget to have put new/charge the batteries in their mic, causing long delays. Why the talent was left to do anything requiring responsibility past showing up is befuddling."

It seems reasonable to assume that the founders were unable to fully understand the customer experience (i.e., that of outsiders), or perspectives of other third parties; as noted by Elliot (2005), narratives concern giving meaning to personal experiences, not those of others. However, the data might be biased because they only contains single-person interpretations, excluding the perspectives of co-founders, customers, investors, and other stakeholders. This bias could be reduced by interviewing other parties, such as co-founders, customers, and even competitors, who "*view the focal phenomena from diverse perspectives*" (Eisenhardt & Graebner 2007, 28). Stories were not tested in this "360 degrees" perspective, because the truthfulness of particular cases was not perceived as a problem due to storytelling motives expressed by the founders (see Table 34). Thus, this study regards founders as a reliable source for identifying strategic challenges, despite the coexistence of alternative interpretations of failure reasons.

6.5.5.8 Reverse survivorship bias

Finally, there might be a risk of *a reverse survivorship bias* because all cases were failures. If we consider the existence of survivorship bias (Brown et al. 1992) as only relating to successful cases, "failure bias" is the reverse by only relating to stories of failure. Technically, the end result might be the same, a skewed realization of the world. Therefore, it is important to keep in mind that the context of the observed dilemmas was failure, and failed startups. Potentially, successful startups do not observe the same challenges at all, although the author finds this difficult to believe. Alternatively, successful startups might have overcome these dilemmas and encountered even more problems at later stages, which remain undiscovered in this study. However, given the fact that there were many analyzed cases, and especially that the focus is on early-stage online platforms, implicitly assuming that overcoming these dilemmas leads to later stages where the strategic problems are different, and purposefully not considered in this study, the reverse survivorship bias cannot be regarded as a major risk for accomplishing the aim of the study.

Moreover, based on discussions with successful founders and also those with undecided outcomes, it was discovered that founders beyond the sample recognized the same issues identified in this study. This leads the author to believe that the same dilemmas exist more widely in the context of online startups.

6.5.5.9 Final assessment of data

The post-mortems included in this dissertation were written by the founders (i.e., entrepreneurs) of failed companies, offering a useful insight on self-reflected reasons for failure. In other words, the primary analyst is the founder. The researcher is a secondary analyst who synthesizes stories, aims to find similarities and differences in them, and increases the level of abstraction (Goulding 2005).

Many founders seemed talented at conceptualizing their problems; for example, the concept of 'cold start' is taken from a founder's terminology. However, as post-mortems are subjective interpretations of reality, their reliability needs to be judged case by case and, when necessary, their trustworthiness questioned.

If the stories are not truth but interpretation, how does this statement affect their value? First, it is clear that, in human sciences, interpretations of reality vary according to the observer or storyteller. However, this premise excludes neither their usefulness nor their credibility as a potential explanation of events. In fact, theories are similar in that they are *potential explanations*, not observed facts. Therefore, employing interpretations, given that they are treated critically in the analysis, is a natural method for theory formulation (Glaser & Strauss 1967).

Therefore, it seems that the correct way to approach post-mortems is to consider them interpretations, not objective truth. According to Charmaz (1990), GT is highly compatible with interpretation. For example, consider a hypothetical startup failure and the research task of determining why it failed. An accountant might argue that it failed because of a lack of revenue (i.e., a *correct* statement); a marketer because they were unable to convert sufficient customers (i.e., a second *correct* statement); and the CEO because it was a recession when they started, and potential customers lacked the money to buy (i.e., a third *correct* statement). Essentially, GT is compatible with various epistemological stances and does not argue that interpretation means no reliable information can be acquired (Charmaz 1990). According to Glaser (2002), it is more important in GT to argue for usefulness than for accuracy.

Verifying the trustworthiness of the stories is hindered by the researcher's non-participation, which would have enabled a deeper understanding on a particular story (Poon, Swatman, & Swatman 1999). Lacking a better measure, stories were included that appeared candid, fulfilled the formal criteria, and contained sufficient detail to be analyzed. However, as noted, they might be subject to several biases, which have been discussed in the previous

subchapters. Essentially, the post-mortems are founders' interpretations, not objective or factual statements of the "truth"[263] in a positivistic sense. That being stated, it is not plausible, considering the often altruistic motives for writing them (see Table 34, p. 268), that founders would deliberately mislead readers. Rather, it is plausible that informants were *not* inventing strategic business problems but reporting what they actually perceived.

Moreover, some founders seemed aware of biases and expressed a desire to prevent them affecting the truthfulness of their story. For example, one founder wrote (Ehrenberg 2008):

> *"These observations aren't worth much. But the interpersonal dynamics, the issues of organizational structure, the need to change strategy in light of new information, the relationship with key investors, all of these are very instructive. I will endeavor to be as honest and candid as possible."*

Statements of this type, along with the self-attribution analysis and explicit motives for story writing, and also the general requirements of GT for data, lead the research to believe that the material is of adequate quality for achieving the research purpose. Moreover, it can be concluded that they are sufficiently precise to articulate the key issues of platform startups on the Internet.

6.5.6 Risks relating to method

Grounded theory has been employed in previous studies focusing on platforms (e.g., Curchod & Neysen 2009; Palka, Pousttchi, and Wiedemann 2009; Mantere et al. 2013). Curchod and Neysen (2009) employed GT to identify perceived positive and negative network effects by users of eBay, an exchange platform. Palka et al. (2009) applied it to identify users' motives to share viral messages in a mobile platform. Mantere et al. (2013) analyzed interviews to build narrative attributions of entrepreneurial failure. Generally, GT is regarded as providing a robust method for analyzing qualitative data (Corbin & Strauss 1990); in particular, employing a systematic approach to build theoretical constructs, while remaining rooted in informants' experiences. Most of the platform literature remains analytical as it is derived from economics (Birke 2008; Shy 2011). Qualitative inquiries are therefore necessary to validate and complement analytical models as they provide a high level of depth (Salomon 1991).

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[263] Given that failure is a relative concept (Watson & Everett 1999), and its interpretation varies among the venture's participants, it is not clear that one truth exists. In contrast, it is more likely that each party has their own interpretation, and the failure outcome is a combination of events and conditions.

In general, purposive, or judgmental, sampling is regarded as appropriate when the research seeks to create new concepts or theory, as opposed to testing hypotheses with statistical inference (Eisenhardt & Graebner 2007). Considering the purpose of this study, selective sampling is not perceived as an issue. Moreover, secondary data pose no problem for GT. Goulding (2005) mentions secondary data as one format in her methodological overview on GT. According to Glaser (2004), "all is data" and the researcher should decide on the most appropriate data for the study. Post-mortem stories were not only publicly available, they also enabled a substantial and varietal sample of Web 2.0 startups to be quickly amassed. Variety was perceived to be useful for the purpose of constant comparison, whereas having multiple informants on one case would have enabled a thicker and perhaps more accurate description. However, according to Glaser (2004), accuracy of description is not a major concern in GT.

The methodology's influence is a particular risk, meaning that results originate from the use of a particular method. As GT aims to find relationships between constructs (Strauss & Corbin 1994), finding a relationship between individual strategic dilemmas (i.e., categories) is a natural result of applying the method. However, credibility is not threatened for two reasons. First, there are connections between the problems in the real world and they are revealed as grounded in the data; thus, they are not concocted. Second, the connections were filtered by selective coding, with some being discarded. Applying judgment emphasizes the most important connections; thus the method does not allow a pre-determined model to emerge.

Charmaz (1990) discusses the merits and challenges of grounded theory in more detail. In general, Eisenhardt (1989) notes that the resulting theory might be narrow and limited to a specific context, as opposed to "a grand theory". As previously established, grand theory was not the purpose of this study, but rather a substantive one. In general, the chosen method was seen to provide rigor in the analytical process, which was perceived to be vague and complicated before learning the key principles of GT. Therefore, the researcher feels the method was appropriate and useful. For a description of how grounded theory was applied in this study, refer to Chapter 2.4.

6.5.7 Risks relating to researcher

In general, the nature of qualitative analysis puts strong emphasis on the researcher's judgment (Seale 1999). This is also a limitation of this study, because the data include self-assessment *a priori*, and are interpreted by the researcher *a posteriori*; in other words, interpreting interpretations.

In particular, researcher bias becomes an issue in GT through the interpretation mechanism by which the researcher elicits meanings from the data (Partington 2000). For example, during data collection, the researcher can influence informants' responses. This is a particular concern with the interview method. Elliott (2005, 11) elaborates on this concern:

> *"[W]ithin certain contexts the narrator may be influenced by imagined or possible future audiences […]. The very fact that the conversation is being recorded suggests that it will at least be listened to at some future time and may also be transcribed and parts of it translated into a written text."*

In this study, stories were collected from the Internet and, considering they were published in personal blogs targeting other startup founders, it is unlikely that founders expected them to become part of academic scrutiny. This eliminates the possibility that the researcher might have influenced the reports. The researcher did not influence in any way the writing of post-mortems, and therefore data collection was completely unobtrusive from the researcher's side.

Theoretical sampling can risk *confirmation bias* if one purposefully seeks only positive answers (Nickerson 1998). It was borne in mind that feedback might not only confirm but also conflict with the researcher's assumptions. Hence, it can be argued that contextualization is a double-edged sword: by increasing domain-specific information, understanding is increased on the conditions in which startups make strategic decisions. At the same time, contextualization can risk *going native* so that informants' sense-making is adopted as truth (Marker 1998); for example, the researcher might start to overemphasize and/or neglect facts in accordance with founders' biases. Also, Charmaz (1990) mentions the risk of going native. This might occur when the researcher is so immersed in the informants' reality that he/she loses objectivity, becomes naïve, and accepts informants' conclusions at face value. As the author was not actually a member in any of the observed or analyzed startups, this risk can be deemed low. Partial immersion, in fact, is beneficial to understanding the context; that is, specific circumstances and conditions which influence actions such as strategic choices. This is implied in theoretical sensitivity, denoting that the researcher is not a *tabula rasa* but does have a personal, professional, and theoretical perspective on the studied phenomenon (Strauss & Corbin 1994).

Regarding analysis, the researcher might be biased in his interpretation; even if no harmful[264] bias exists, some degree of bias is inherent in interpretative qualitative analysis (Johnson 1997). It is important to note that GT is an

[264] Harmful as in deliberately excluding facts that would contest the theory under development.

interpretative method (Gasson 2003), and therefore particular risks can arise regarding misinterpretation. However, interpretation is associated with theoretical sensitivity (Glaser 1978; Strauss & Corbin 1994). Relating to this study, the author read a large amount of related information on online business to increase his understanding on the topic, including, for example, startup-focused blogs, online community discussions, and books, which is likely to influence his understanding (Jones & Alony 2011), although hopefully in a way that leads to more useful conclusions.

Finally, Glaser (2004), who places great faith on a researcher's ability to employ data in the correct way, states that:

> *"GT discovers and conceptualizes the latent patterns of what is going on. It is always relevant. If a GT is accused as being interpretive, which is probably meaningless, it is a very relevant interpretation."*

In other words, Glaser consistently approaches constructivism in his underlying logic that descriptive accuracy is not as relevant as the theory's ability to influence action. The way in which subjects perceive the world in turn influences their action, and so perceptions/interpretation have the potential to become self-fulfilling prophecies (Merton 1948; see also Charmaz 1990). This perspective is adopted insofar as to state that whether or not the interpretation is perfectly correct in description, its implications point the reader to the correct direction.

In GT, verification is not generally performed by others but by the researcher through engaging in constant comparison of subjects (Glaser & Strauss 1967) and utilizing his/her curiosity in theoretical sampling, or acquiring new slices of data to challenge the emerging theory. Glaser and Strauss (1965) place a great deal of trust in the researcher, and their message is that researchers should trust their findings, achieved through hard work and immersion in the context of the research subjects. Even if two analysts rarely reach exactly the same conclusions when analyzing a topic independently (Glaser & Strauss 1967), both can agree on each other's works.

Although this might seem paradoxical, it only highlights the non-linear creative process associated with GT, leading to individuals emphasizing different angles. For example, this study could have focused on founders' decision-making biases, or on the ideal UG model. According to the author, both would have explained the problematic features of the failed startups. It was simply the author's judgment call to focus on strategic dilemmas, which can be regarded as no more right or wrong than alternative calls. What can be further stated on this, however, is that the author believes the few identified dilemmas can be employed better to explain platform startups' failures than utilizing a

large number of generic failure factors that seem to be randomly scattered in startups; that is, in the context of platform startups, their relevance is higher.

6.5.8 Generalizability

A question typically posed for any type of research is "how generalizable is it?" The issue is tackled in this subchapter.

The highest level of abstraction in GT is termed a *formal theory*, which relates to a phenomenon in general, whereas a *substantive theory* relates to a phenomenon in a given context (Glaser 1971). For example, a theory on business failure would be considered a formal theory (i.e., general focus), whereas a theory on startup failure would be a substantive failure (i.e., contextual focus). To these, Glaser (1971) adds "grand theories" that can cover almost all types of situation and exist across phenomena; for example, explaining failure in any type of context could constitute such a theory.

According to Glaser and Strauss (1965), a theory should be judged on its intended generalizability. In some cases, substantive theory can be regarded as being equivalent to interim theory (Glaser 1971), or a step in the process to formal theory. However, it can also be perceived as an independent entity, and therefore its merits should be judged by considering the context for which it was devised. It is noteworthy that, in this case, the researcher relies on *analytical or logical generalization* when applying the theoretical conclusions to other units in the same context (Collingridge & Gantt 2008). This process should not be confused with statistical inference, that is, generalization from sample to population, as it is a statistical technique for determining applicability (Wagner et al. 2010).

Corbin and Strauss (1990) relate generalizability to a study's reproducibility, which resembles the transference criteria discussed earlier. They (*ibid.*, 250) note that "*probably no theory that deals with a […] phenomenon is actually reproducible insofar as finding new situations or other situations whose conditions exactly match those of the original study, though many conditions may be similar*." Consequently, Strauss and Corbin (1994) postulate that there are spheres of applicability, ranging from an individual case to a local community to an international setting, and so on, towards a global pattern. In a similar vein, Urquehart et al. (2010, 364) note that "*as the researcher moves up the level of abstraction, the range and scope of the theory increases*."

By applying these ideas, it can be contemplated that there are *spheres of applicability* also for this study, which are presented in the following figure.

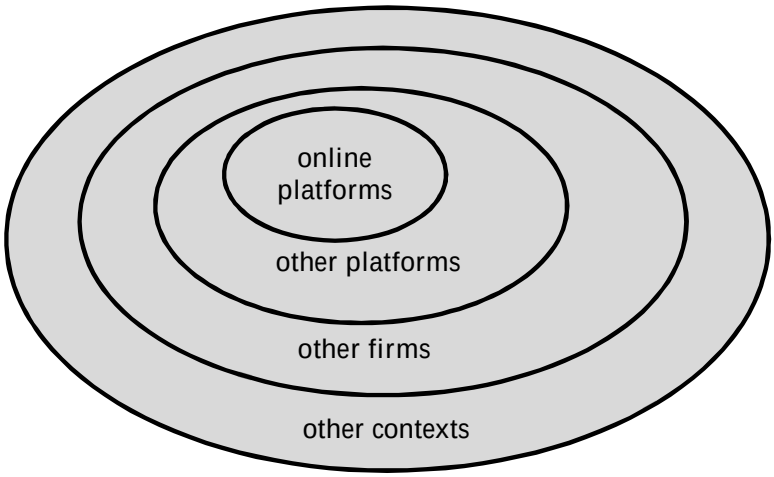

Figure 18 Spheres of applicability

Therefore, the findings of this study are generalizable, at a minimum, to the four online platform types that tend to apply UG, at least implicitly, and indirect monetization, including the freemium model in an attempt to internalize externalities from interaction among platform participants.

Increasing the level of abstraction is generally perceived to increase a theory's applicability (Strauss & Corbin 1994). Moving away from an online platform also means that more general theory literature becomes available, although at the cost of losing empirical context (Glaser 1971). Generally, the process of generalization aims to lose contextual factors and introduce a general logic (i.e., formal theory) concerning why particular relationships hold across many contexts. Increasing the abstraction therefore removes online-specificities; for example, different motives of interaction manifested in platform types, or commonly applied UG and indirect monetization.

This way of examining the generalizability implies that strategic problems do not always exist; that is, if their existence depends on specific conditions, when some contextual conditions are removed from the picture, the dilemmas can no longer be identified. In particular, the problems addressed here require online-specificities, or they might not emerge. For example, if the platform charges an access fee and customers are willing to pay, there is no monetization dilemma. Consistent with the perspective of critical realism (Kempster & Parry 2011), the dilemmas are contingent upon the context.

This issue can be illustrated by attempting to increase abstraction on the study's main model, Figure 15 (p. 195), which shows the relationships between dilemmas. In Figure 19, the author followed Glaser's (2008) advice to abstract from time, place, and people, and only to apply general concepts. In

this study, a probable or most appropriate way is arguably towards business failure in general, a formative theory on failure of sorts.

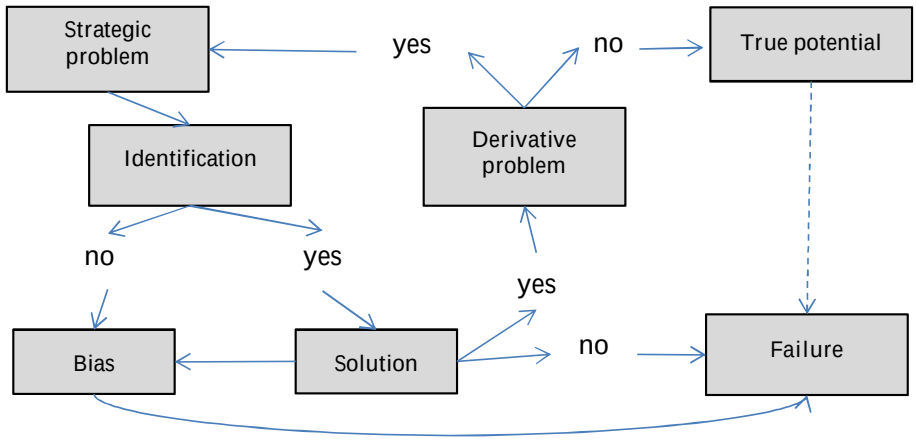

Figure 19 A tentative formal theory

The theory explains failure through strategic problems and biases. It argues that there are strategic problems requiring solutions for the company to avoid failure. If these problems are solved, there will be a derivative problem that requires a solution, and so on. It is argued that solving the problems is preceded by their identification. This identification is potentially prevented by bias; because of his or her biases, the founder or manager might be unable to identify the strategic problems. If this happens, the company will fail. However, even if the problem is identified, its solutions might be associated with a bias; the founder or manager is unlikely to think of a solution in the proper way due to his or her bias. Again, the company will fail. Only by solving all of the problems and their derivative problems can the company achieve its true potential in the market. However, it is argued that the true potential can also equal failure; for example, when there is no true demand.

While being logical, this approach highlights the problem of moving from substantive to formal theory: it loses the context. Thus, there is now a general description, but with two emergent issues. First, the theory still needs to be applied to other contexts to determine how well it fits to them (Charmaz 1990). Second, by moving from the substantive context, the practical applicability to online startups has, to a major extent, now been lost. Indeed, this seems to contest the critical realist criteria, namely, practical adequacy and plausibility (Kempster & Parry 2011), as there are no longer grounds to estimate the contexts in which the theory works without reintroducing and studying those contexts. As a consequence, practitioners are less likely to

understand what this means in their context. Thus, generalizability at worst seems to lead to a double bind of losing both context and relevance. If the study accomplishes other evaluative criteria for GT, the added usefulness of generalizing from substantive theory can be regarded as negligible.

This is somewhat in conflict with Corbin and Strauss (1990, 267) who argue that "*[t]he more systematic and widespread the theoretical sampling, the more conditions and variations that will be discovered, therefore the greater the generalizability, precision, and predictive capacity of the theory*." It is argued here, based on the aforementioned logic, that while theoretical sampling increases the generalizability of a study, it *reduces* precision, and that this might *decrease*, not increase, the predictive capacity of the theory. This conflict seems also to apply when examining classic GT. In fact, Glaser (2004) mentions that the general concepts apply in any domain where they exist, *but* that they require modification by constant comparison. Essentially, if they need to be modified when applied, then they *do not* apply at their general level, and are thus not generalizable prior to being employed in action.

The Glaserian and Straussian approaches differ in their understanding on reproducibility. While Corbin and Strauss (1990, 251) require that "*given the same theoretical perspective of the original researcher and following the same general rules for data gathering and analysis, plus a similar set of conditions, another investigator should be able to come up with the same general scheme*." Glaser (2002) leans more towards variation in ability to conceptualize, and perceives that some are more talented in this than others and that conceptualization differs from description, which is a simpler cognitive process. In fact, such an idea is implicit in classic GT through the concept of theoretical sensitivity. If traits such as personal and professional experience (Strauss & Corbin 1994) influence how well the researcher is able to elicit concepts and theory from the data, it is unlikely that two persons who vary greatly on these dimensions would reach exactly the same conclusions.

Corbin and Strauss (1990) fail to explain this discrepancy, unless their "theoretical perspective" means the exact same theoretical sensitivity. Given the interpretative nature of GT, such a match can be considered realistic as two identical snowflakes. In contrast, the origins of GT lie in the substantive theory with its contextual score (i.e., usefulness): "*The invalidation or adjustment of a theory is only legitimate for those social worlds or structures to which it is applicable*" (Glaser & Strauss 1965, 10). In this study, the author contends that it would be unlikely for another researcher reproducing the study to draw exactly the same conclusions. However, in whatever ways they might explain failure, other researchers would most probably rely on the properties of the dilemmas. In other words, when reconciling perceptions between the imaginary new research and this study, there should be no fundamental

disagreement. Thus, the spirit of the conclusions would remain intact, and the author assesses that reproducing this study would yield results leading to similar practical implications and usefulness.

As can be seen in the platform literature, strategic challenges vary by platform type. For example, lessons from online platforms might not be applicable to platform markets such as the newspaper/media industry, payment cards, or operating systems examined in other studies (Rysman 2009). For example, taking the general assumption of *network effects prevent switching* from the standards discussion (Katz & Shapiro 1994) would be an overstatement, as network effects are by definition not decisive in an environment with multiple coexisting platforms and multihoming, which the Internet as a business environment clearly is and proprietary standards are not.

In terms of improving the quality of the substantive theory, Figure 10 (p. 93), which displays the totality of emerging dilemmas and biases, is a strong candidate as it explains much of the startup process leading to failure. In particular, biases and bounded rationality in decision-making have been acknowledged since Simon (1956); including cognitive psychology and behavioral game theory would increase the explanatory power of the substantive theory, and potentially lead to discoveries that could be formalized and applied across contexts. Indeed, including biases would improve the explanatory power of *why* founders choose particular strategies that can afterwards be considered destructive, and thus improve the work done here.

In the spirit of substantive theory, the results are limited to Internet startups, or early-stage technology ventures in online business. Therefore, based on this study, the results cannot readily be generalized to other types of technology startup such as life science or clean-tech, other types of startup, platform companies, or firms in general. These entities are likely to have different dynamics that render the conclusions of this study inapplicable. However, the generalizability is extended beyond failed startups to all platform startups on the Internet. There is no reason to believe that successful platform startups have not faced these issues; indeed, they have solved them. Thus, further theoretical sampling can be targeted at the strategies of successful platform startups. Moreover, there are startups with *indecisive* outcomes and, without doubt, the greatest share of startups encountered by the author in the various startup events belong to this group. They can benefit from this study by identifying potential strategic problems and solutions, and by adopting strategic platform thinking.

Finally, the author would like to point out that two-sidedness is not an exclusive feature of platforms; in contrast, as a perspective, it can be applied to examine very many situations. As two-sided dynamics relate not only to platforms, Rysman (2009) refers to two-sided strategies as opposed to two-sided

platforms. By further developing his idea, one can speak of *platform logic*, or two-sided logic, that is applicable to contexts not normally understood as platforms. For example, events: the better the speakers, the more tickets can be sold. Relatedly, the higher the speaker fees, the higher the sales; given that the quality of the speakers is proportional to his or her fee. Another example is education: the better the teachers are in a given school, the better the caliber of students wanting to apply. Moreover, two-sided logic applies to retailing, which was considered distinctly separate from the platform model in Chapter 3.1. Clearly, the selection and variety of merchants affects how likely the end customer is to buy, and thus two-sided dynamics are present. Internal marketing is another example of two-sided logic. The happier the employees, the better they serve the customers, and thus the happier customers become; *vice versa*, the more unhappy or moodier the customer, the worse the motivation of the employees serving him/her, and so on[265]. The implication for firms is to understand what each interactive side appreciates, and assess the degree of critical mass needed to evoke the desired response (i.e., conversion).

6.5.9 Overall assessment of credibility

Regarding credibility, the nature of data means that they cannot be treated as facts. Risks to credibility comprise informant biases (e.g., recall bias and respondent bias) that can involve consciously or unconsciously ignoring relevant aspects, researcher bias closely associated with interpretation, and the specific methodological choices.

In general, a limited number of firms and respondents might result in a one-sided perspective and prevent generalization in a statistical sense; although, if judged as a qualitative case study, the number of cases here can considered in line with such studies. Moreover, there are also benefits associated with the approach taken in the study and, considering the research purpose, the issue of "myopia" cannot be regarded as a major issue. First, the founders are highly knowledgeable on the challenges they faced. Second, stories are independent accounts, written in different places at different times and interpreting different startups, which lends support to identified patterns in the real world. Third, the researcher has confidence in knowing the startup reality sufficiently well to make credible claims on it. Finally, the analysis suggests that the founders were aware of their personal biases, and might even have made them explicit. Overall, this leads the author to believe that the material and analytical

[265] The mentioned chain effect relies on contagion of emotions, but the logic is two-sided as the welfare of each group is linked to the other.

procedures are appropriate to draw credible conclusions. Regarding saturation, the researcher does not expect that the conclusions would drastically change if more post-mortems had been included in the study. This has been validated by discussions with numerous founders beyond the initial sample.

Other strengths arise from the use of GT. By detailing specific techniques, it enabled a novice PhD student to choose techniques that felt natural and flexible but still guided the analytical process from start to finish. Grounded theory is distinct from qualitative data analysis (QDA) methods due to its emphasis on theory, not “thick descriptions" or case studies. It also differs from analytical modeling, which often makes strong assumptions to remain tractable; GT is not constrained by the same rigor, and can therefore expand to great lengths while remaining rooted in the relevancy of the data. Truly understanding the strengths of the method motivates one to continue, and creates confidence in one’s analytical abilities. Overall, the author feels confident in recommending the grounded theory method to studies that aim at conceptualization and theory development.

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APPENDIX 1 CODING GUIDE

Name	Guide	Example
2_BUSINESS MODEL		
economic viability	Implying lack of economic viability.	*The larger lesson here is that business is ultimately driven by economics, and economics are driven by incentives. Entrepreneurs, and in particular web entrepreneurs, are often driven by a myopia that says "if I like it, so will everyone else."*
aggregation	Strategy to source data from other websites	*First and foremost, we'll use technology we've built to aggregate information about startups.*
extended firm	Delegating tasks to users.	
network effects	Referring to network effects or network value.	*We struck upon the idea that if we had fifty journalists, and they each cross-promoted each other to their social networks, then over time we would get more and more people to read each other's content.*
platform	Founders describing platform business model.	*For those unfamiliar with imercive, we were a social media marketing company that provided branded instant messaging applications as new touch points for consumer engagement.*
user generation		
community strategy	Founder talks on a community of users.	*The audience took responsibility for what went on at each local [startup] site and debated local issues in a civil manner because it was about their community. And as in their physical community, they were proud of it and took care of it.*
ugc, careful for not taking advantage	Exploiting users will result in resistance.	*Since we weren't making any money for them, and it appeared to them–correctly–that no one was even reading their content, there was no earthly reason they would keep writing "for us".*
search externalities	Founders talks on search engine benefits.	*For years there were certain queries about cement production and unemployment where we were the first or second links. The corollary to this rule is good*

Name	Guide	Example
		google foo [website traffic] *won't save you. You need that traffic to translate into a community. A visit is not an interesting statistic especially in a business that requires the community to produce content.*
user generation, incentives	Incentives to motivate crow participation.	*And when we offered coffee cards in exchange for posts, [startup] users actually rebelled. They thought we were making the site too commercial, even though ads didn't seem to bother them at all […] because local ads are local information.*
viral strategy	Ideal product diffusion either through "built-in" viral features or frictionless sharing.	*An exception is inherently viral ideas, especially one-to-many virality, where normal use of your product reaches new users, not "word-of-mouth" viral that requires users to advocate you. With inherent virality, a barely adequate product might suffice, though even then marketing should accelerate growth.*
2_FUNDING	***[relates to Peter Pan's dilemma]***	
money		
expenditure	Overly fast spending of funds.	*[The startup] was fed-but-anemic and slowly roasting its cash. Do it again and I'll concentrate those costs at the beginning. We would have had twice the product in 2/3 of the time.*
money, excess	Getting funding had a negative impact.	*So the net effect was that it enabled to raise all this money that kept us far from the customer. Truth be told, we were probably afraid of customers at this point because we didn't want to disappoint them or look bad.*
money, irrelevant	Founder indicates funding is not critical.	*Unless [the startup] reached an expansion stage, where the sales model was known and repeatable, I'm ever-more convinced that raising institutional capital would not have increased our chances of creating value for the existing shareholders. The company would have survived longer, but that's not the goal.*
money, lack	Lack of funding had a negative impact.	*When you go it alone, you've got the freedom to do whatever you want, but it's hard to stay focused when the project is always competing for your attention with other, usually paying, work.*
reason for failure, money	Money was indicated as a reason for failure.	*The single biggest reason we are closing down (a common one) is running out of cash. Despite putting the company in an EXTREMELY lean position, generating revenue, and holding out as long as we could, we didn't have the cash to*

Name	Guide	Example
		keep going.
reason for failure, spent time on funding	Spending time looking for funding had a negative impact.	*We spent 6 months raising our angel round, and finally closed it after launching our public beta in February 2008. We raised less than we should have (Chris Dixon notes that the worst thing a seed-stage company can do is raise too little money and only reach part way to a milestone, which is great advice). We spent 3 months getting ready for raising our next round, then 6 months beating our head against a wall trying to raise money during the financial collapse.*
2_MARKET		
barriers to adoption	Reasons why users would not adopt the platform.	*After eventually discovering that setup and configuration was our primary adoption problem (and after trying and failing to implement various strategies to make it simple and easy), we tried to move to the other end of the spectrum.*
changing behavior	Perceived difficulty of changing behavior.	*I began to realize that experts in most fields are usually pretty busy people, and with the exception of technical folks (who spend tremendous amounts of time in front of computers), most other people don't like sitting in front of one, and probably won't answer questions for a few measly bucks.*
competition	Why competing platforms are superior/inferior.	*We were offering information on great albums and community voting. But other sites like Last.fm and Hype Machine were offering the actual music. That was a competitive advantage that's hard to beat and we lacked a significant user base to convince enough people*
lack of history, trust	Reported cause for mistrust by customers.	*In community-generated media, trust is everything. When you ask for submissions, contributors go through an instant internal calculation: "Do I trust these people with my work?" When your site is brand new, you've got no record to rely on. And with more shady "user-generated content" schemes popping up every day, people have their defenses up (as well they should).*
market, small market syndrome	Conclusion of the founder that the market is too small *vis-à-vis* ambitions.	*Given the industry trends we were seeing, we just didn't see a light at the end of the tunnel worth surviving for. This market may get slightly better, but it's not going to be a big company.*
2_MARKETING		
branding	Branding the platform.	*Our name, ChubbyBrain, is memorable, a bit playful and a touch irreverent.*

Name	Guide	Example
		We, however, generally put out personality-less, fact-based analyses to show how good our data was (there were some exceptions). Instead of making our name and content/approach consistent and hence an asset, our branding mullet confused people.
communicating product, positioning	Positioning the platform against competition.	*We didn't describe what we wanted to do clearly enough. When I told people the idea in person, they always really liked it. But when they came to the site, they didn't get it.*
high customer acquisition cost	Expressed concern over costly customer acquisition.	*We never seriously figured out customer acquisition, and had trouble growing throughout our various pivots. Customer acquisition is hard and more expensive than most people realize when starting a company.*
personal selling	Personal selling as a means to drive platform participation.	*The plan was to partner with marketing agencies as well as sell directly to clients similar to the approach taken by providers of custom branded widgets, Facebook apps, and mobile apps. This strategy eventually produced some great results but it was a case of too little, too late.*
2_PRODUCT		
technology choice	How technology choice affected platform development.	*I reasoned that the platform was the core of our technology, and we were a technology company, and smart technology companies needed the flexibility that comes from writing the core of their platform themselves. In retrospect, this could only be considered premature optimization.*
validating idea, technology	Ensuring or not ensuring that there is demand for the product.	*Another choice was the decision to start with arcade games, which was done very early on (even before I joined, I think) without much thought at all. It was just the first thing that came to mind when we thought of casual gaming, so we said "Let's start with that, and then expand into other archetypes when we have more experience."*
launch	*relates to pioneer's dilemma*	
followers advantages	Examples of late-mover's benefits.	*Wesabe launched about 10 months before Mint. More the shame that we didn't capitalize on that early lead. There's a lot to be said for not rushing to market, and learning from the mistakes the first entrants make. Shipping a "minimum viable product" immediately and learning from the market directly makes good sense to me, but engaging with and supporting users is anything but free.*

Name	Guide	Example
launch, benefits of early	Examples of early-mover's benefits.	*We talked about "release early/release often," but were scared of looking like idiots in front of major Wall Street and hedge fund clients. Is it better to wait a bit before releasing to have a more compelling product or to begin getting feedback on a less impressive offering? We chose #1; in retrospect I think we should have chosen #2. By choosing to wait we lost our intimacy with the customer (Mistake #5 again), falling into the classic (as a "green" entrepreneur I didn't know this, but as a seasoned four-year venture investor I know this now) trap of pursuing a "science project," not building a commercially salable product.*
launch, delayed	Examples of late-launch problems.	*At some point, we reached an almost go-live product. But after showing it to a few VCs, we realized we missed some features to make it truly social. Instead of releasing the beta, we decided to create the v2 of the product. Wrong. We will never finish this v2 (lack of money, slowly dying motivation).*
launch, disadvantage of early	Examples of early-launch problems.	*After our funding, instead of investing in the product features to deliver on EventVue directly driving people to events (hindsight: mistake), we immediately went out and tried to sell the social network tool to conference organizers.*
2_TEAM		
hobby, half-hearted effort	Indication of non-serious business.	*It turned something I liked doing into a chore mainly because at the same time I was busy marketing the site, redesigning it, and attending classes. (I was in college for business for 18 hours of the week).*
internalization	Indicates profound understanding of business logic.	*But no matter how many times you read or hear certain lessons, you have to do it yourself to really understand.*
lack of focus	Mentioned lack of focus (*relates to pivot dilemma*).	*We made the product much too broad such that it did a little bit of everything. Unfortunately, it didn't do anything exceptionally well. As an example, when we used it to replace our phpBB message board instance, our community was in an uproar because it lacked many of specialized features a mature forum offers (e.g. notifications and handling code examples in a comment).*
learning gains	Mentioned learning benefits due to startup (*relates to platform specificity*).	*As a music site it has hasn't exactly "failed" at the moment, it still pulls in around 3000 people a month mainly from search engines. I now consider it a hobby site and I'm looking forward to applying what I learned with my next start-up, Integrate.*

Name	Guide	Example
market memory	Referring to simultaneous similar strategic decisions that are based on common information (*relates to reference point bias*).	*As Twitter received more attention, clones showed up everywhere. My decision was not to compete with a new and already crowded space, but to find a different angle. I decided to focus on scalable technology, making a bet that once Twitter and others will get popular, there will be a real need for that kind of technology by other players.*
motives for sharing, why tell story	Motive for writing post-mortem.	*I read posts on Hacker News about "Why my start-up failed" and found them interesting because it's a raw start-up story not the fairy tales that magazines like to write about. So here is my shot at it.*
second opinion, interpretation	Other comments on the startup in addition to those of the founder.	*I was probably what you would call an early Chicago adopter of Meetro, and I thought it was a great idea, and still do. With each succeeding version of the software, however, the interface seemed to get weirder and weirder until I couldn't figure it out anymore.*
self-attribution	Founder assigning blame of failure to self.	*As co-founder and CEO of Lookery, the buck stops with me and no one else.*
startup fatigue	Sentiment of frustration over many hardships (*relates to 'runway'*)	*We could have gone about trying to fix Meetro but the team was just ready to move on.*
3_THEORY AND CONSTRUCTS	**[this section includes dilemmas]**	
dilemmas		
cold start	Inability to get content without users.	*Underestimated the "Cold Start" problem, I read this article by Bokado Social Design which talks about a big issue you face with a social site, especially when it relies on user-generated content. The value you provide to your users centers around the content on the site, so to build a user-base you need a lot of content created by the first users to kick-off the community.*
lonely user	Inability to get users without other users.	*[I]f someone wasn't online when you were online, they were no good to you. While the real-time chat aspect of the application made for some really serendipitous meetings, it also made it harder for people to gauge the activity of their communities, especially if they logged in at odd hours, people were set as away, etc.*
monetization	Inability to charge money and get users.	*For four years we have offered the synchronization service for no charge,*

Name	Guide	Example
		predicated on the hypothesis that a business model would emerge to support the free service. With that investment thesis thwarted, there is no way to pay expenses, primarily salary and hosting costs. Without the resources to keep the service going, we must shut it down.
peter pan	Inability to grow without funding.	*When you've got money, you can take more time to do it right, but you've got higher expectations for returns, and a whole host of other complications. When you go it alone, you've got the freedom to do whatever you want, but it's hard to stay focused when the project is always competing for your attention with other, usually paying, work.*
pivot	Impossible to change the course of business but also to keep it.	*[T]he most significant change, which I did not appreciate until it was too late, was the fundamental shift in the nature of the startup. I moved from building a consumer-facing website to a combination of infrastructure provider and software developer which made the overhead cost much higher, time to market longer, and resources much more difficult to find.*
remoras curse	Joining a platform returns users but gives away power.	*We exposed ourselves to a huge single point of failure called Facebook. I've ranted for years about how bad an idea it is for startups to be mobile-carrier dependent. In retrospect, there is no difference between Verizon Wireless and Facebook in this context.*
industry-specific problem	A problem that is specific to a market or industry.	*I know there's a place for a wisdom of crowds approach in the publishing world, but publishers and artists are still figuring it out. For now, it seems like a direct submission model is what people are most comfortable with.*
problem of active use	Keeping users active after registering.	*Look carefully at most hyper-local sites and see just how much posting is really being done, especially by members of the community as opposed to the sites' operators. Anybody who has run a hyper-local site will tell you that it takes a couple of years just to get to a point where you've truly got a vibrant online community.*
illusions, fallacies and biases		
build it and they will come	Expecting the product to "sell itself".	*We fell into the "build it and they will" come school of thought (although even when they came, we still weren't in good shape). Users didn't review because there was no enlightened self-interest for them to do so. Nobody wanted to edit our data for the same reason. People submitted companies to our database*

Name	Guide	Example
		mainly looking for a link.
dog food blindness	Refusing to admit flaws in the product.	*The original ChubbyBrain was a happy marriage of our interests wrapped in customer indifference. We never talked to users/customers to see if this would be of interest to them. And so customers ultimately told us through their indifference that they didn't care about our idea.*
confirmation bias	Seeking positive feedback and ignoring negative one.	*Man was I stupid. When people asked to sign up without it, I told them no. When the people who did sign up were worried about things being posted to their walls, I didn't understand the problem. When readers said they wouldn't sign up to comment, I thought it was just a small minority.*
perfect product fallacy	Refusal to launch until the product is perfect (which is then never is).	*And these bad behaviors were reinforced by an unplanned event that sharply impacted our psyche: being on the front page of the Financial Times. It is hard to call it a mistake since we didn't seek to get such exposure, but I put it down as Mistake #3. To be honest, this single fact was a very meaningful factor in our failure. It raised the level of expectations so high that it made us reluctant to release anything that wasn't earth-shattering.*
illusion of free	Expecting *a priori* that customers would not pay.	*Video producers are afraid of charging for content, because they don't think people will pay. And they're largely right. Consumers still don't like paying for stuff, period.*
it won't happen to me	Tendency to expect that risk will not realize in own startup.	*We saw that this didn't yet exist in an easy to use format. We saw others that had tried and we figured they had failed because they did a bad job and we could do better. The lesson to learn here is If there are burning husks of cars along the roadway, you should probably assume that driving there is dangerous.*
reference point bias	Employing famous success stories as a model for decisions regarding one's own startup.	*[W]e thought "let's take elements from sites we like and tweak them" and we'll get the same magical effects on our site that they've gotten. Wrong. Features don't work in a vacuum. They work because you take time to understand your customer and then build features to accommodate them.*
copy business model to new context	Explicit ambition to copy elements of another business model into a new industry.	*The idea itself for Contrastream wasn't too innovative or original. It was inspired by Digg.com which had applied the same model to news and articles on the Web. I still believe applying this model to music is interesting and useful, but there were so many other me-too Digg sites.*

Name	Guide	Example
sunk cost fallacy	Refusing to make changes due to time spent.	*Since the service was our child we were reluctant to make a decision about closing it faster and limit losses. We've been tricking ourselves thinking that everything would be fine while we couldn't get the application back to work properly.*
technology bias	Tendency to believe that technology will solve business problems.	*Instead of having product management as the advocate for the customer and the product evangelist, we had technology running the show in a vacuum. Huge mistake. This allowed us to perpetuate the science project for much, much longer than we should have.*
race to bottom	Relates to competitive pressure to offer a free product.	*We also considered refocusing Xmarks as a freemium sync business, but the prospects there are grim too: with the emergence of competent sync features built in to Mozilla Firefox and Google Chrome, it's hard to see users paying for a service that they can now get for free.*
runway	Indicates time running out.	*Big corporations can afford to spend a billion dollars and wait 10 years, though, while startups usually can only afford a few tens of thousands and about 6 months. You have about zero chance of building and getting people to adopt a platform in 6 months.*
path dependence	Alternative explanation for refusal to make changes (*relates to 'sunk cost fallacy'*).	*The initial idea does change, and it's almost certainly wrong. The thing is, the initial idea determines how the initial idea will change, which is crucial to all the execution that follows it. And the devil is often in the details: little decisions made early on can crucially impact big decisions made later.*
transference problem	Realization that famous examples do not apply in all cases (*relates to 'reference point bias'*).	*Amazon proved beyond any doubt that this is a valid and powerful business model, but very few companies can afford to build such a service and then wait for people to come. It also helps that Amazon did not start with the goal of providing these services, but identified an opportunity once their own retail infrastructure was in place.*

NB. Some codes are omitted for parsimony.

APPENDIX 2 IS THE COLD START DILEMMA REALLY A DILEMMA?

Strictly speaking, any chicken-and-egg dilemma is not a strategic dilemma in the sense of a contradictory decision-making situation, as it does not involve a strategic choice, but a dependency. In its base form, it is a rather a question of "how to attract the first party to the platform?" rather than "which one of the two negative outcomes should I choose?" However, it is possible to formulate it as a dilemma that will satisfy the definition, without assuming too much context and therefore losing generality. This is achieved by introducing two conflicting conditions:

1. If the startup provides the content, user generation effects will not take place as the startup has provided the content.
2. If the startup does not provide the content, user generation effects will not take place as there is no content.

Hence, the strategic action would be to create content or not, and both outcomes would result in a "cold platform".

Behind these conditions, there is the premise that users only create content because other users have previously created content; for example, Wikipedia only exists because it is Encyclopedia Britannica. Note that the problem was framed so that there is a dependence on user generation (UG): that is, that users will take charge of content production in the long run. This excludes first-party content platforms, such as Spotify that utilizes a music library provided by the record labels, whereas an indie music platform needs to attract user-generated music from indie artists. This restriction is based on the theoretical model of ideal UG (see Chapter 3.4).

A second alternative would be to frame the dilemma in the question: "Which party should the startup focus first?", whereby focus on A would neglect B which is required, and *vice versa*. This, however, would introduce contextual factors unless strong assumptions were made concerning the feasibility of parties, the applied monetization model, and also the propensity to produce and generate content. For example, clearly the startup should focus on those parties who are most likely to generate content; however, this is not a strategic problem but, rather, one of identification (i.e., *how they are to be found*).

Furthermore, the cold start dilemma, as defined here, is irrelevant if UG does not lead to the virtuous cycle: *What happens if user-generated content does not lead to the creation of new content?*

APPENDIX 3 SUPPORT FOR EARLY AND LATE LAUNCHES

Too early	***Too late***
"Cute hacks can cost you time. Take the time to do things right from the beginning." (Wilson 2006).	*"The biggest fallout of building our platform ourselves was that we couldn't build quickly enough. When you roll your own infrastructure, everything takes time, more time than you can afford. And we had promised the journalists that we would very quickly build a large list of features, none of which were produced nearly quickly enough. This was the major cause of disillusionment–we over-promised and under-delivered […]."* (Biggar 2010).
"There's a lot to be said for not rushing to market, and learning from the mistakes the first entrants make. Shipping a 'minimum viable product' immediately and learning from the market directly makes good sense to me, but engaging with and supporting users is anything but free. Observation can be cheaper. Mint (and some others) did well by seeing where we screwed up, and waiting to launch until they had a better approach." (Hedlund 2010).	*"Even though I was very careful about scope and our focus on product, I underestimated the time it would take to get to a V1 and then inject it into the market."* (Smith 2008).
"After our funding, instead of investing in the product features to deliver on EventVue directly driving people to events (hindsight: mistake), we immediately went out and tried to sell the social network tool to conference organizers." (Johnson & Fraser 2010).	*"We tried to build the ultimate AJAX calendar all at once. It took a long time. We could have done it piece by piece."* (Kan 2006).
"[T]ried to build a sales effort too early, with too weak of a product after initial financing […]." (Johnson & Fraser 2010).	*"Too much money is like too much time; work expands to fill the time allotted, and ways to spend money multiply when abundant financial resources are available. By being simply too good at raising money, it enabled us to perpetuate poor organizational structure and suboptimal strategic decisions."* (Ehrenberg 2008).
"We launched too fast. I'm a big believer in launch fast, get feedback, make changes. We launched fast, got more feedback than we could handle, and failed to make changes. You can't expect people to wait for you to get it right." (Powazek 2008).	*"We talked about 'release early/release often,' but were scared of looking like idiots in front of major Wall Street and hedge fund clients.[…] By choosing to wait we lost our intimacy with the customer […] falling into the classic […] trap of pursuing a 'science project,' not building a commercially salable product."*

	(Ehrenberg 2008).
"That old cliché about not getting a second chance to make a first impression? Corny but true. When you stumble out of the gate, it can be hard to regain your footing. We should have done more testing of both the core idea and the site itself." (Powazek 2008).	*"And these bad behaviors were reinforced by an unplanned event that sharply impacted our psyche: being on the front page of the Financial Times. It is hard to call it a mistake since we didn't seek to get such exposure, but I put it down as Mistake #3. To be honest, this single fact was a very meaningful factor in our failure. It raised the level of expectations so high that it made us reluctant to release anything that wasn't earth-shattering."* (Ehrenberg 2008).
"Lookery's Profile SaaS/universal cookie mechanism is far more economic and effective than cookie exchange systems in a world where ad media and targeting data are separate commodities. That world is a year or more in the future." (Rafer 2009).	*"It took us 24 months to fail. 2 years. That's a life time in web standards. We should have launched something (even ugly) in the first 6 months, and pulled the plug after 12 months. Don't waste time and money on a long lasting project if you don't see the end of the tunnel."* (Kretz 2010).
"[O]ur initial archetype choice became the basis for our product. Meanwhile, most of the growth in the casual gaming industry has been in puzzle & word games, so we were positioned wrong from the start." (Tang 2008).	*"The technology decision to use C++ was well founded. However, it failed to take into account, or at least prepare for the inevitable reality of being unable to find people to join me. Any major web company reaching massive scale eventually turns to C/C++ for performance. Given the fact that Nouncer had no competition at all when the idea was first conceived [...], I decided to take a little bit longer before launching to build a solid foundation. This, of course, turned up as a big mistake – but it is far from clear that I would have been first to market either way."* (Hammer 2008).
"As a pioneer in the user-generated, hyper-local field, Backfence hopefully will pave the way for many other efforts to create locally focused online communities that ultimately will become profitable businesses." (Potts 2007).	*"[T]he spam issue […] prompted us to not push version 1.0, instead wanting to see if we could come up with a more powerful release using NLP to mark the kick-off. In retrospect, this was a big mistake […] We should have gotten it out there, been kicked in the head by tough customers, and iterated like crazy to address their needs."* (Ehrenberg 2008).
	"At some point, we reached an almost go-live product. But after showing it to a few VCs, we realized we missed some features to make it truly social. Instead of releasing the beta, we decided to create the v2 of the product. Wrong. We will never finish this v2 (lack of money, slowly dying motivation)." (Kretz 2010).
	"[T]he cost of building scalability ahead of time is extremely high, and for most startup is cost prohibitive. The decision to turn Nouncer from a consumer service to an infrastructure provider forced a significant early investment that had very little change of materializing." (Hammer 2008).

APPENDIX 4 STRAUSSIAN EVALUATION OF CREDIBILITY

Criteria (Corbin & Strauss 1990)	Self-evaluation
Research process	
C1: How was the original sample selected?	The sample was selected based on its degree of interest; post-mortem stories seemed like a rich source of information.
C2: What major categories emerged?	Initially, the research was guided by the intent to identify failure factors. Emerging categories followed the functions with which these factors were associated; for example, Marketing, Product, and Finance.
C3: What were some of the events, incidents, actions, and so on that, as indicators, pointed to some of these major categories?	The founders' sense-making implied there are many reasons for failure; the grouping seemed to naturally evolve into these functional areas.
C4: On the basis of which categories did theoretical sampling proceed? That is, how did theoretical formulations guide some of the data collection?	This was based on the core category, strategic problems. They were presented to different founders on various occasions. These were not interviews, but casual startup events.
After the theoretical sampling was done, how representative did these categories prove to be?	There were no indices of new strategic problems pertaining to the specific type of firms in which this study was interested.
C5: What were some of the hypotheses pertaining to conceptual relations, that is, among categories, and on what grounds were they formulated and tested?	For example, the relationship between the cold start and monetization dilemmas. After axial coding, it seemed clear that startups which try to compensate a lack of users by free product not only fail to solve it, but run into additional trouble. Through comparison with other cases, this seemed to be a pattern in the material.
C6: Were there instances when hypotheses did not hold up against what was actually seen? How were these discrepancies accounted for? How did they affect the hypotheses?	None come to mind; this aspect of analysis could arguably have been improved by more actively developing hypotheses.
C7: How and why was the core category selected? Was this selection sudden or gradual, difficult or easy? On what grounds were the final analytical decisions made?	The selection was gradual, based on several coding phases: failure → failure factors → strategic problems and biases → dilemmas. Out of all the choices, dilemmas seemed to most influence failure. The selection was not easy or difficult, it felt natural after reading the material many times. The conceptualization by founders also pointed to this direction.

Empirical grounding of findings

C1: Are concepts generated?	The study generates new constructs, such as the cold start dilemma, the lonely user dilemma, remora's curse, and the monetization dilemma. New conceptualizations also relate to online platform types and the 'ideal user generation model'. The terminology is partially derived from the founders and industry, therefore being grounded.
C2: Are the concepts systematically related?	The concepts are related as antecedents (e.g., ideal user generation model), outcomes (e.g., cold start dilemma) and solutions (e.g., freefying). There has been an attempt to link and examine them as a whole. During the coding process, the author aimed to code relationships systematically with the help of qualitative analysis software (i.e., NVivo).
C3: Are there many conceptual linkages, and are the categories well developed? Do they have conceptual density?	The linkages are formed between dilemmas and their solutions. There is also work done to link dilemmas with founders' biases, but that is omitted from this report as the researcher decided go for a deeper analysis of dilemmas in exchange for range, or explanatory power. Moreover, the report includes several linkages from the analysis of dilemmas to their online specificities, namely typology and ideal user generation model. These fortify the substantive nature of the theoretical offering. Finally, a paradigm model was not followed; thus, in the Straussian sense, a density of categories might be lacking.
C4: Is there much variation built into the theory?	Variation in the data was considerable due to the variety of problems reported by the startups. Given the relatively few number of dilemmas, the author feels he chose those that explain most of the problems in terms of relevance for the platform model, criticality in terms of failure outcome, and patterns emerging from the data. Thus, the author feels the end result establishes parsimony and scope. However, due to exclusion of non-platform-specific startup dilemmas and founders' biases, the theory has less dimensions and explanatory power than it would have if these categories were included. The author still believes their exclusion was a correct choice, given that 1) the ensuing complexity would have extended beyond the scope of one study; and 2) for theoretical integration, it had been necessary to examine too many extant theories, leaving the work's theoretical integration fragmented. These categories are better left for further studies.
C5: Are the broader conditions that affect the phenomenon under study built into its explanation?	An attempt has been made to enable the reader to understand how Web 2.0 startups, in which this study is interested, differ from earlier dotcom companies. Moreover, the general role of competition is speculated so that it is seen as a potential reason for platform startups on the Internet applying indirect monetization (i.e., offer free products). These conclusions are not definite, although they show an attempt to understand the bigger picture.

C6: Has “process” been taken into account?	Process has been implicitly taken into account so that, given their type and specificities (i.e., user generation and indirect monetization dilemmas) are seen as mechanisms affecting platforms in the online context, leading to the outcome of failure.
C7: Do the theoretical findings seem significant and to what extent?	Theoretical findings of this study are less significant than its intended managerial usefulness, partially due to its substantive nature. However, it does expand the concept of the -and-egg problem in the online platform context; this might encourage other theorists to reconsider the nature of the problem in their particular settings. It also offers a typology and criteria for typology of platforms that is meaningful, considering their problems in relation to adoption and active use. This study is limited in that it does not present a “general theory of platforms”; however, such an attempt was never its purpose in the first place. Nevertheless, the study does offer good grounds for continuing the research of online platforms.

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